MOTOR BOATING

119 WEST 40TH STREET
NEW YORK

CONTENTS
for DECEMBER *1921*

VOLUME XXVIII, No. 6

Annual Buyers' Reference Number

Photograph by Levick

A race for bug-eyes on the Chesapeake which was handled last summer by Morton Stelle, St. Michaels, Md.

THOSE of us whose lot in life happens to be the publishing of a boating paper can always tell when the boats are hauled out. Then one's boating enthusiasm takes form from another angle — the reminiscing begins, the discussion of what has been and that which is to be, takes shape. It is then that the Editor is taken into one's confidence, quite properly. To the best of our recollection we cannot remember a month when our mail bags have been so filled with letters from the motor boatmen as during the past month.

Our offices, always headquarters for visiting motor boatmen when in town, has been honored by the presence of many recently. Gar Wood and Lee Barrett dropped in to talk over some important plans they have; Edsel Ford also found time to put aside his many other interests and spend a few minutes with us discussing boats and engines; Fred Still, about the busiest thinker there is, was in; so were Eddie Edenburn, Arthur Utz, Cornelius Vanderbilt, Jr., Commodore Eagan, John Hacker, Harry Greening, Bill Gibb, Frank Gheen, George Leary, Jr., Roy Halsey, Commodore Williams, Ed Stone, Commodore Hieber, Carl G. Fisher, James Allison, Webb Jay, C. A. Criqui, and a lot of others have been giving much time recently to the development of racing plans for next season.

THE cry will be raised by some that the America Power-Boat Association in altering its cash prize attitude has surrendered, that the West came down to the Annual Meeting with the intent purpose of upsetting those causes which the Association has championed for years and accomplished their desired object in spite of all else. But such statements will not be the truth and will only be made by those who have an ulterior motive in mind—made by those who enjoy a game of golf more than promoting the sport of motor boat racing, by those who were not present at the meeting and therefore have not a perfect picture of the conditions and circumstances surrounding the action.

The American Power-Boat Association's action was solely a tribute to the loyalty of its members from the Great Lakes, principally Detroit and Buffalo, in backing everything which the American Power-Boat Association has stood for since Detroit became the center of the world's speed boat racing, although some of the Association interests may not have been in popular favor locally. The delegates at the meeting, fully appreciative of Detroit's knowledge of working conditions, by a practically unanimous vote, voiced their favor of progress. By their action the A. P. B. A. again shows its broadminded policy and its willingness to work full-heartedly for the sport.

MoToR BoatinG is published monthly by the International Magazine Company, William Randolph Hearst, president; C. H. Hathaway, vice-president; Ray Long, vice-president; Joseph A. Moore, treasurer; W. G. Langdon, secretary; 119 West 40th Street, New York City. Single Copies, 25 cents. Yearly subscription in United States and Canada, $3.00. In foreign countries, $4.00. When you receive notice that your subscription has expired it is best to renew it at once, using the blank enclosed. When requesting a change of mailing address, give the old as well as the new one. Allow four weeks for the first copy to reach the new address.

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Use it in your car in winter and on your boat in summer. Or better still, order two—you'll never take it off after it's once installed.

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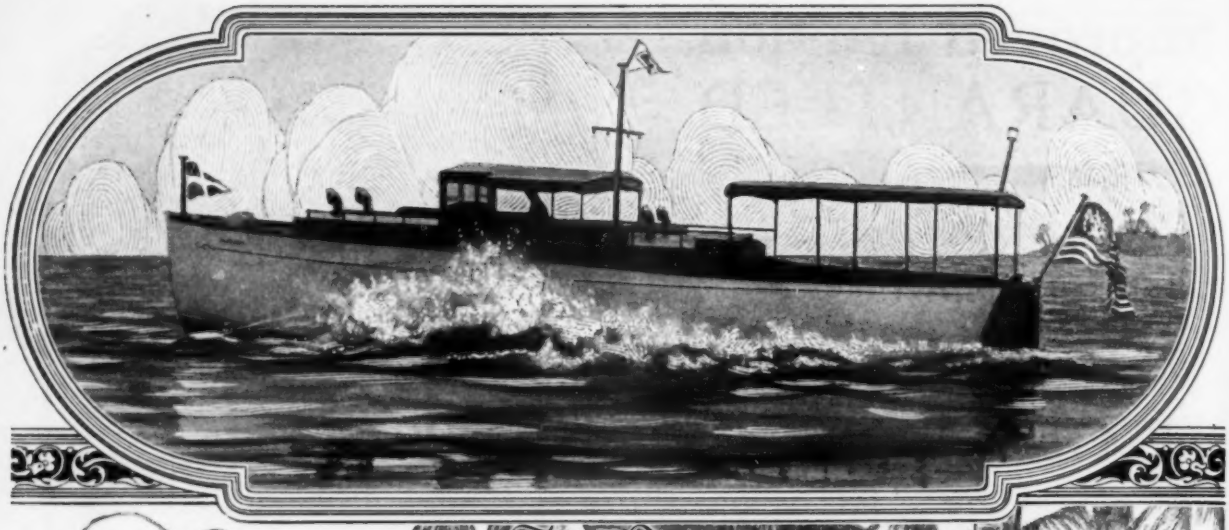

The 42 Footer

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with immediate delivery or rail shipment of the
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42 AND 54 FOOT EXPRESS CRUISERS
SINGLE AND TWIN SCREW

Many features of experienced design and superior construction adapt these cruisers particularly well to Florida conditions and requirements. The full headroom engine compartments, the luxurious cabins with comfortable sleeping quarters, and the well equipped galleys are excellent examples.

These and many other features make both craft ideal for extended cruising. Perfect distribution of deck and cabin space provide ample accommodations for large parties on day-runs.

Another worthy feature is the speed of 20 m.p.h. and more. Pride of ownership is justified by beauty of line, unsurpassed elegance and uninterrupted performance. Great Lakes Cruisers are built by craftsmen.

Send for Catalogue No. 206 describing the 42-footer, and Catalogue No. 335 describing the 54-footer.

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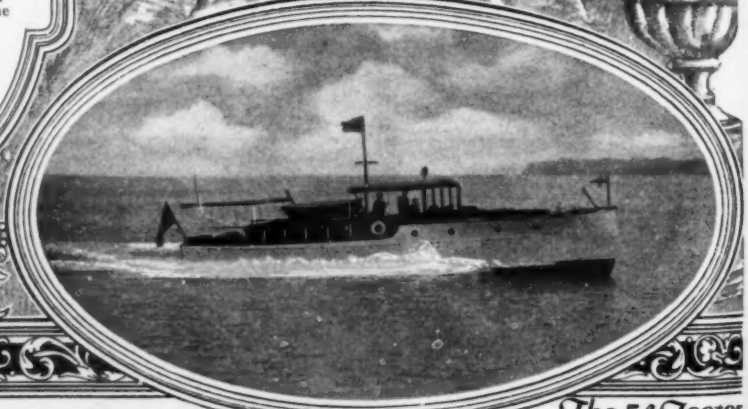


The 54 Footer

Advertising Index will be found on page 138

MOTOR BOATING

119 West 40th St., New York, N. Y.

Photographs by Clegg

The Author at the helm of the launch that flew the Stars and Stripes on a lake on an island in the ocean

Cruising Under the Shadow of Kletsa

By Cornelius Vanderbilt, Jr.

GAR WOOD has told us of the divine attractions of a cruise on the Great Lakes; Captain Slocum has enumerated the intermingled lochs of sunny Scotland; the boys of Killaire have described with equal vividness the hues and views of the Thousand Islands, but it remains for someone to give us even the remotest idea of cruising on a lake on an island in the ocean. Yet such is the tale I am about to recount.

Vancouver Island has long been recognized as one of the fairest spots on the North American continent, and its highways have been synonymous with excellence in road building. But few of us who live in the work-a-day world outside of this natural paradise have ever learned anything concerning its inland lakes, of which I believe there are over thirty.

The supreme manifestation of beauty is reached not far from the little village of Alberni, situated at the head of the Alberni Canal, a natural fjord twenty-four miles in length, almost cutting Vancouver Island in two, and averaging a half to a mile in width and three hundred feet deep. Of all the natural harbors on the west coast, the Alberni Canal controls the most advantageous location, for it is not only five hours closer to Vancouver than the cities south of it, but it is twenty-four hours closer to the Orient and Siberia.

Under the shadow of Kletsa

A few miles northwest of Alberni, the lakes, which are a playground to hundreds of thousands of people in the Northwest, stretch their varied shore-lines in bewildering frankness to the eager tourists. And it is here, on the reflectant waters of one of these lakes, that we shall commence our cruise.

The craft upon which we traveled was a twenty-one-foot launch, equipped with an NL-1 Palmer engine, and capable of assuming, under pressure, ten miles an hour. Decked-in for'ard and aft, but with seating space about eight feet long, and covered, when necessary, with an aquascutum awning, she presented as fleet and neat a little vessel as one desired to find. A gasoline tank with ten Imperial gallons, equivalent to twelve United States gallons, and a few minor accessories completed her list of available objects.

The crew varied from one to six, but all had equal opportunity of viewing scenery such as I doubt exists anywhere else in the world, and of tasting the vagaries of the savage life one can live, if so he desires.

Sproat, the gem of all the lakes in western Canada, has as many contours as a centipede has legs, and each presents a new and wonderful spectacle. Tremendous snow-capped peaks bathe their wooded toes in the cool waters at their base, gigantic giants of the Cascade range smiled benevolently upon us, while miniature islands, adorned with luxurious vegetation, welcomed us morning, noon and night, for be it known that Sproat in all her glory can bespeak a shore line of more than one hundred and twenty miles.

Cruising under the shadow of Kletsa, for Kletsa, one of the highest peaks in Canada, rises from the shores of the lake, was indeed then a wonderful experience.

Cascades emanating from tremendous heights

Rainbow trout are nearly as plentiful here as salmon on the Columbia

The nights were spent drawn up upon the sandy side of some lovely woodland stream, where the rich waters emptied themselves in great fury into the lake at their feet. Some of us slept in the boat, with mattresses which in daytime we stored beneath the for'ard deck; others slept in tents ashore and some doubled up beneath a canvas lean-to.

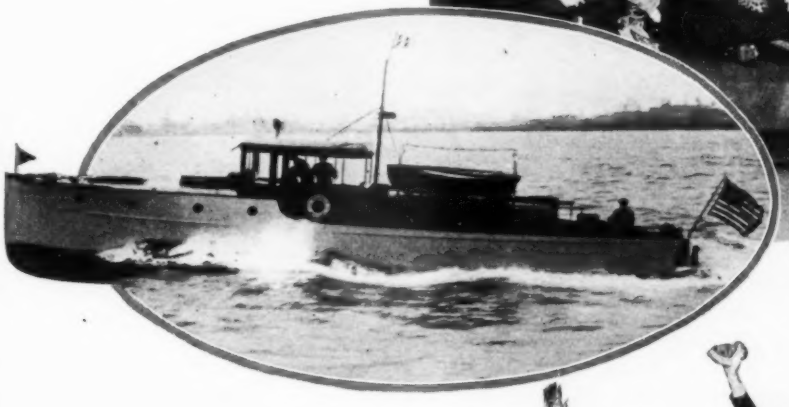
By day we traveled leisurely, inspect-

(*Continued on page 77*)

Mile after mile of ever-changing ranges fading into the beyond

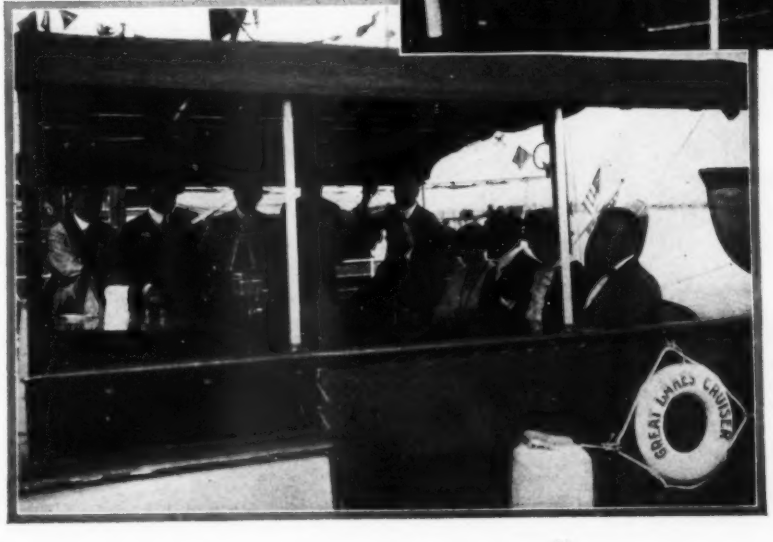
How Many Can a Cruiser Accommodate?

It Is No Longer Necessary to Keep a Big Boat to Accommodate a Large Number of Guests in Comfort



These boats are seaworthy and will navigate on any waters in any weather with a turn of speed of 20 miles per hour or better when fitted with modern motors

The modern express cruiser of about 54-feet length, built according to standardized methods, can accommodate a very large number of persons for day trips as well as a party of eight and a crew of two for extended cruising. Ten persons on the forward deck observing the Fisher Trophy races at Detroit do not seem to be crowded



A large gathering of men engaged in the motor boat industry in the cockpit of a standardized Great Lakes express cruiser at Detroit following the conclusion of some of the races. Seventeen men took part in this get-together meeting and in addition numerous others were in the cabins of the boat at various times for conferences

On the bridge deck of the boat eleven persons were comfortably accommodated to watch the Gold Cup races as the guest of W. C. Morehead, president of the Great Lakes Boat Building Corporation. The development of naval architecture has been such as to permit of housing many people in the relatively small standardized express cruisers of the present day

Photographs by Levick and Rosenfeld

Some of Those Who Have 1921 Season the Most

Two of the most recent converts to the belief that surface propellers are the answer to all propulsion problems—George F. Crouch, designer of the Rainbows and many other fast and winning runabouts, discussing with Harry Greening, of Hamilton, Ontario, some knotty problem

Below is shown Clarence Sidway, Fleet Captain of the Buffalo Launch Club, and one to whom credit should go for the success of the Buffalo 1921 Regatta

At the right Ed Gregory, who in his standardized Bear Cats has developed a runabout which is far ahead of anything ever seen before. These boats are 26 footers and show a speed of about 35 miles an hour with a four-cylinder motor

Grif Clark, of Toronto, owner of Leopard V, and George Leary, Jr., who has done so much to make Sea Sleds famous this year and who, we understand, is planning some even faster

Henry and Edsel Ford in the latter's runabout Sialia, Jr., on their way to offer the entire facilities of the Ford plants in Detroit and Ontario to the crew of the English challenger for the British International Trophy, Maple Leaf VII. In the boat are also two officers of the American Power Boat Association—Arthur Utz of Buffalo and the Editor of MoToR BoatinG

Helped to Make the Successful of All

The two handsomest men in the industry—William E. Gibb, of the Frisbie Motor Co., of Middletown, Conn., and Jack Farr, of the Kermath Mfg. Co., of Detroit, Mich.

Carl G. Fisher, of Indianapolis and Miami Beach, Fla., the donor of the Fisher Trophy for runabouts powered with marine motors and donor, with Commodore Gar Wood of the Wood-Fisher Trophy for runabouts powered with any type of engine. The next races for these two trophies will be held at Miami, Fla., March 2 to 9, 1922

Now that the question as to what is a marine engine has been definitely settled, Fred Lord, at the left, and John Hacker are discussing the problem, which so far has confused all experts, viz., "When is a hydroplane not a hydroplane?"

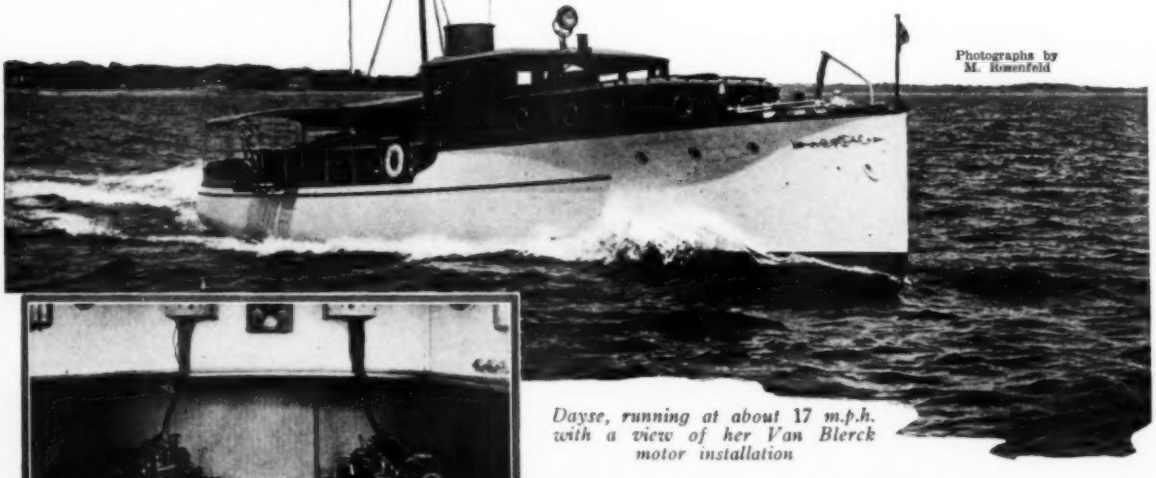
At the right Col. and Mrs. Tate of England. The former was helmsman of the ill-fated Maple Leaf VII, which made an unsuccessful attempt to lift the British International Trophy during the past summer

William C. Morehead, of Milwaukee, judging at one of the important race meets of the past season. The insert shows Commodore Ralph Sidway of the Buffalo Launch Club

A Dayse on Long Island Sound

New Luders Express Cruiser Arouses Favorable Comment Owing to Its Graceful Appearance and Many Interesting Features

Photographs by M. Rosenfeld



Dayse, running at about 17 m.p.h. with a view of her Van Blerck motor installation

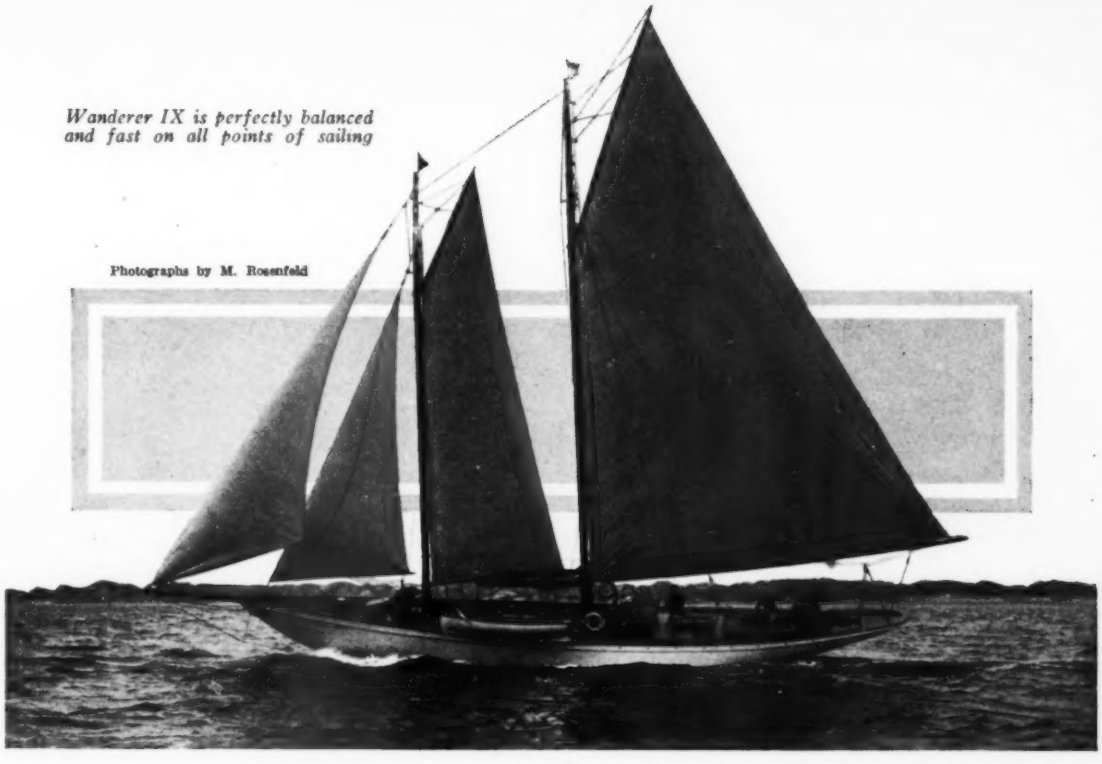
AN unusually smart and speedy cruiser has just been put into commission on Long Island Sound. Much favorable comment has been aroused by this boat and it is a very unusual craft in many ways. When she was launched she was christened Dayse by her owner, J. Percy Bartram, of Caritas Island, Conn. The builder of this interesting boat was the Luders Marine Constructing Company of Stamford, and the splendid reputation which this firm enjoys for high class yacht work was again sustained in the construction of this boat.

In order to stand the buffeting by the waters of Long Island Sound, to which it will be subjected, the construction of the boat was made unusually sturdy. The stem and keel were made of selected Connecticut oak and the frames of the same material are 2 inches square and closely spaced. Double planking was used to obtain the maximum strength, selected yellow pine being used for this purpose. The hull proper is divided into five separate and non-communicating compartments by means of four water-tight bulkheads. Although the freeboard forward has been kept high for sea-worthiness, the trim and the cabin house have been so well balanced that the appearance is that of a low-lying, high-speed craft.

The cockpit is furnished with generous cushions and makes a most desirable retreat

The owner's dining room in the spacious deck house forward

The engine compartment is located amidships and is an exceptionally large, light room with full head-room for the attendants throughout. A pair of 8-cylinder Van Blerck engines of the medium speed type are installed and so arranged that they operate at a greatly reduced number of revolutions. The minimum of vibration is secured in this way, as the motors seldom turn at more than 800 r.p.m. and at 750 revolutions this boat did 17¾ m.p.h. on her trial trip.



Wanderer IX is perfectly balanced and fast on all points of sailing

Photographs by M. Rosenfeld

Wanderer IX, a New Auxiliary Schooner

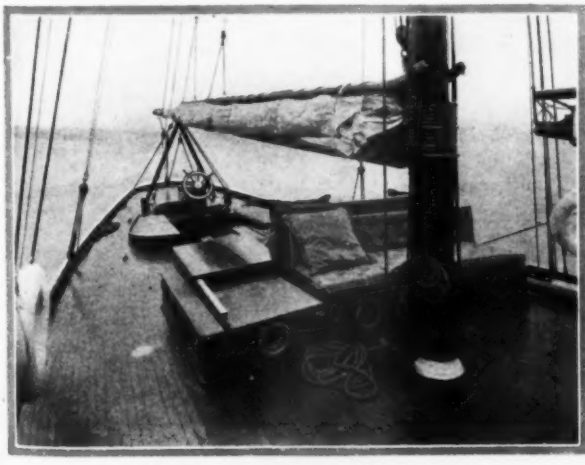
The Most Popular Type Auxiliary Vessel of the Present Day Is a Compromise Between the Fisherman and the Yacht

THE auxiliary schooner Wanderer IX, designed by Charles D. Mower for Harvey J. Flint of Providence, R. I., is one of the finest examples of the small auxiliary schooner which is each year becoming more popular. She is a compromise of the yacht and fisherman, as her form below the water-line closely resembles that of a modern fisherman, but above the water-line her lines are carried out into graceful overhangs with a handsome sheer, making a boat that is much better looking than the short-ended fisherman type.

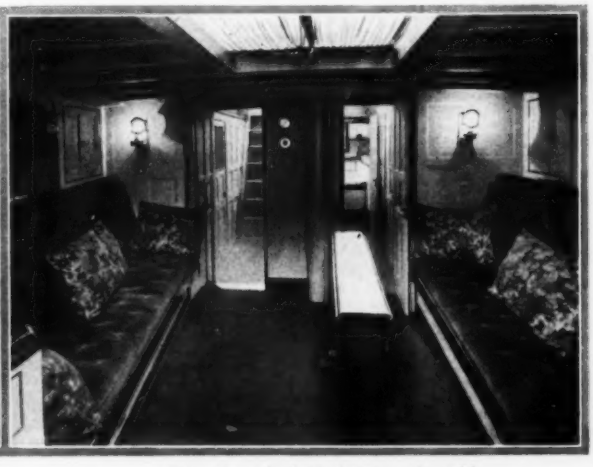
Her accommodations below deck are very comfortable as she has a main cabin 10 feet 6 inches long and the full width of the boat. The mainmast is at the aft end of the cabin so that it does not obstruct the floor space. There are wide sofas on either side upholstered with spring cushions so that they can be made up as comfortable berths. Back cushions are fitted so that they can be used as upper berths. There is an unusual amount of locker space on each side back of the transoms with large buffets at the forward end and two clothes lockers at the aft end.

In the after part there is a fine double stateroom for the owner with a toilet room opening from the passageway between cabin and stateroom.

The auxiliary power is a 20 h.p. Knox and is located just aft of the mainmast in a separate compartment with doors opening into the companionway and passage. A Thompson feathering propeller is used. The gasoline tanks are located under the deck on either side of the cockpit and have a total capacity of 100 gallons. The sail plan is well proportioned with a total area of 1,822 square feet. Her dimensions are, length over all, 64 feet; water-line, 44 feet; beam, 15 feet 3 inches; draft, 8 feet 0 inches.

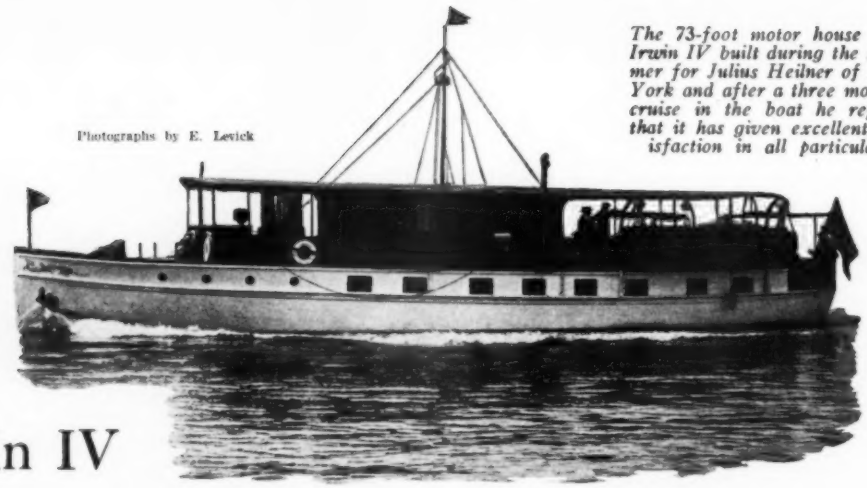


Main deck of Wanderer IX looking aft



The aft end of the large main cabin

Photographs by E. Levick



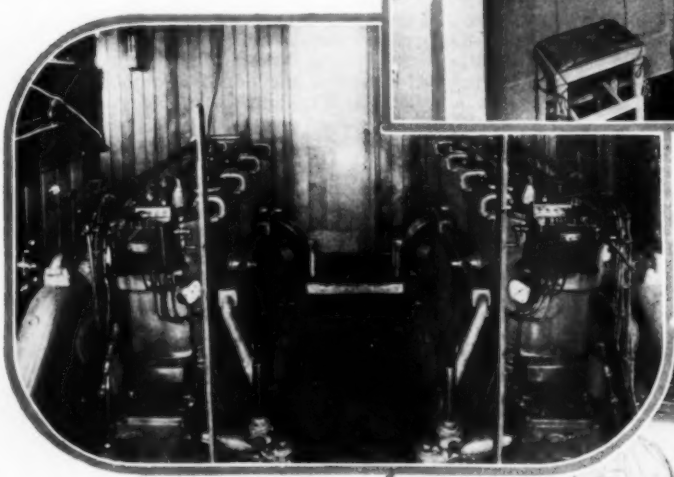
The 73-foot motor house boat Irwin IV built during the summer for Julius Heilner of New York and after a three months' cruise in the boat he reports that it has given excellent satisfaction in all particulars

Irwin IV

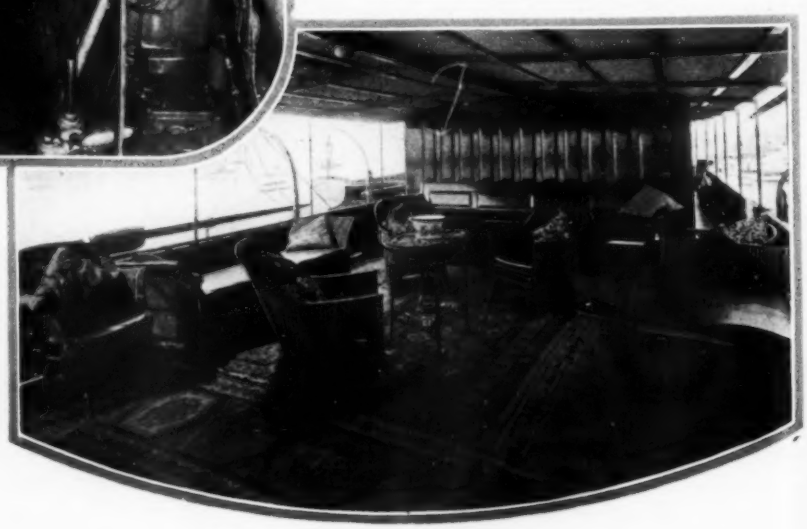
An Unusually Attractive Motor Houseboat Which Provides All the Comforts of Home

While the hull is heavily constructed the interior furnishings do not betray this. The owner has four state rooms of which the adjoining is a typical illustration. All interior work is panelled in either mahogany or white pine while the deck house above is all mahogany

Irwin IV was built by the New York Yacht, Launch and Engine Co.



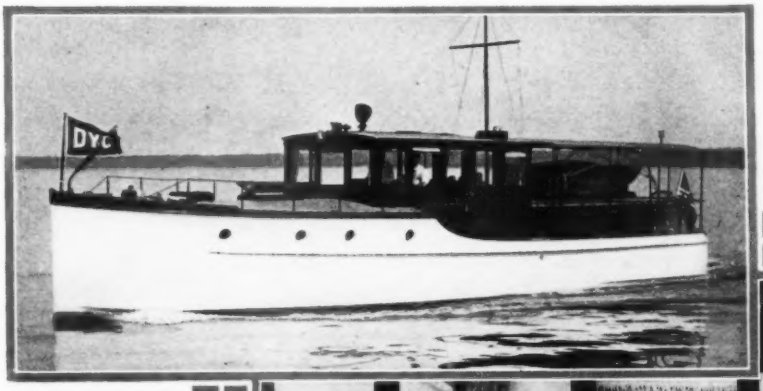
The engine room houses a pair of four-cylinder 20th Century motors which produce a speed of about 11 m.p.h. In addition a Universal 110-volt generating set with Edison batteries furnishes power throughout. A Kelvinator refrigerating outfit of a half ton capacity keeps all stores cold on extended cruises



The large expansive deck space just aft of the deck house is particularly well adapted for a deck lounge. Comfortable wicker chairs with many cushions and a few other accessories make this an ideal place to spend the days while cruising. The pantry on this deck is well located so that refreshments can be readily served to the guests

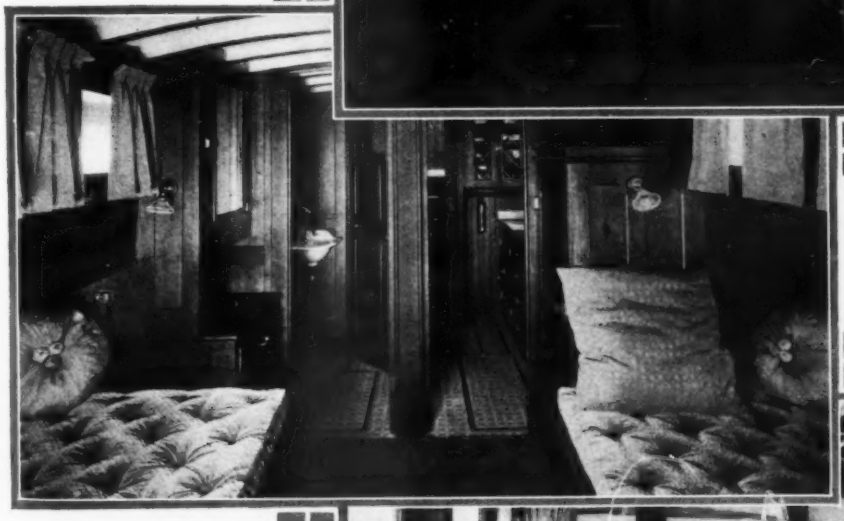
The Ultimate 50-Foot Cruiser

A Vast Amount of Comfort and Convenience Has Been Condensed Into a Small Craft With Real Livable Qualities



The 50-foot Rochester cruiser built by the Rochester Boat Works combines all the features of comfort and convenience called for by old experienced yachtsmen. Six persons and a crew of two can easily be carried on long cruises

The combined pilot house, lounging saloon, and dining room. It can be made as comfortable as an open bridge and in case of inclement weather can be transformed into a watertight cabin in a few moments. Every day is thus a fair weather day for these boats

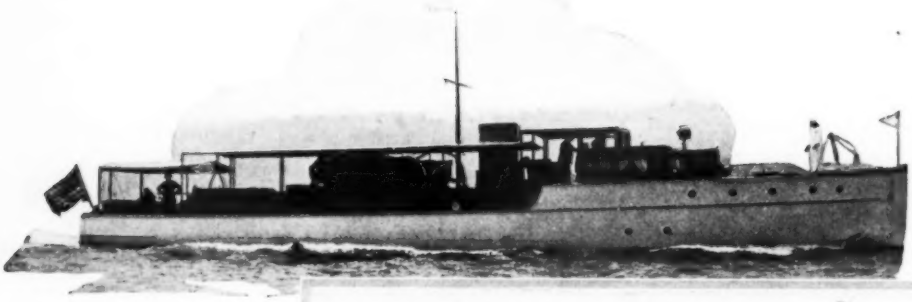


The owner's compartment is the aftermost living room on the boat. Two wide berths with a multitude of conveniences, such as clothes lockers, mirrors, dressers, etc., are provided here. All window openings are thoroughly screened and in addition provided with curtains

The built-in seats in the deck house. Underneath is the engine room, which is large and has good head room. A pair of Van Blerck motors of four cylinders each are installed, although any suitable power plant can be fitted as may be desired. There is sufficient space to take care of plants of 300 h.p. or more

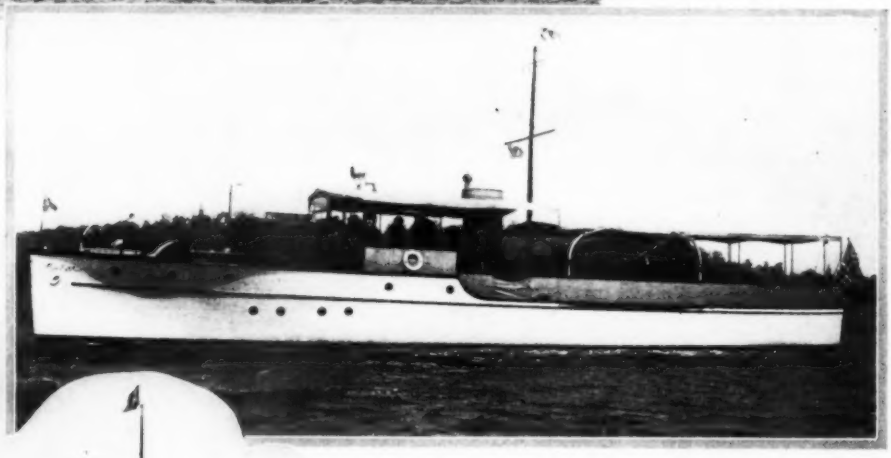
Consolidated Motor Yachts Which

Five Representative Motor Yachts in the 80-Foot Class Built by the



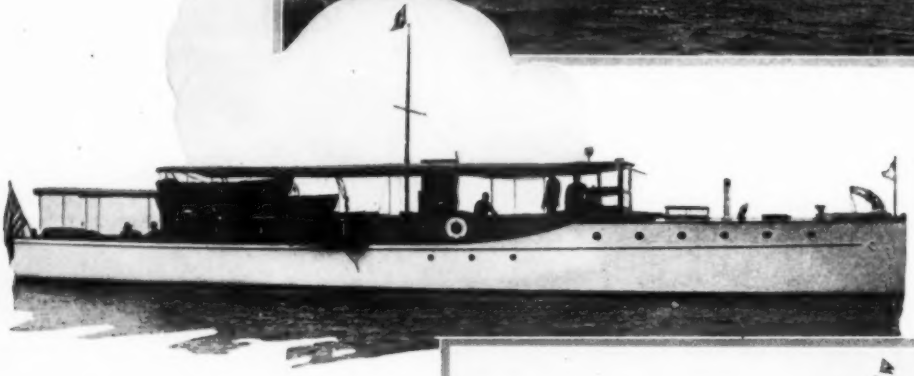
BELLA

84 feet, designed and built for H. C. Stutz, powered with two 6-cylinder medium duty Speedways, speed 17 miles



BETTY K

80 feet, designed and built for E. C. Crossett, powered with two 6-cylinder medium duty Speedways, speed 17 miles

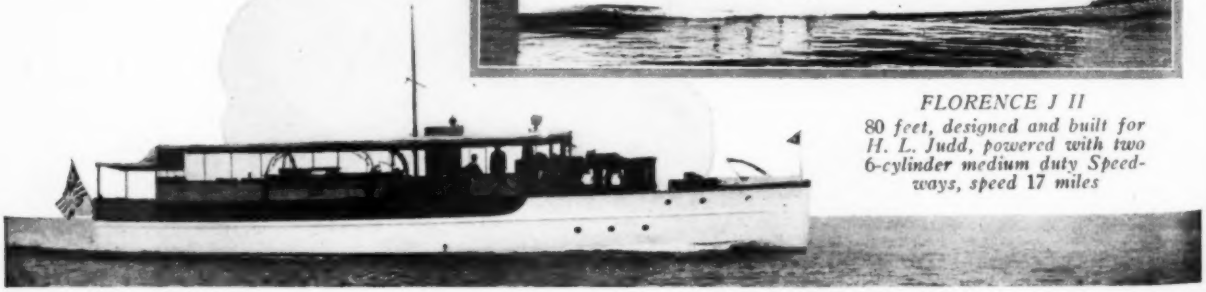


FILLETTE

Designed and built for J. W. Kiser, 80 feet, powered with two 8-cylinder Speedways, speed 18 miles

KLAHANEE

Designed and built for L. M. Wainwright, 78 feet, powered with two 8-cylinder Speedways, cruising speed 16 miles per hour



FLORENCE J II

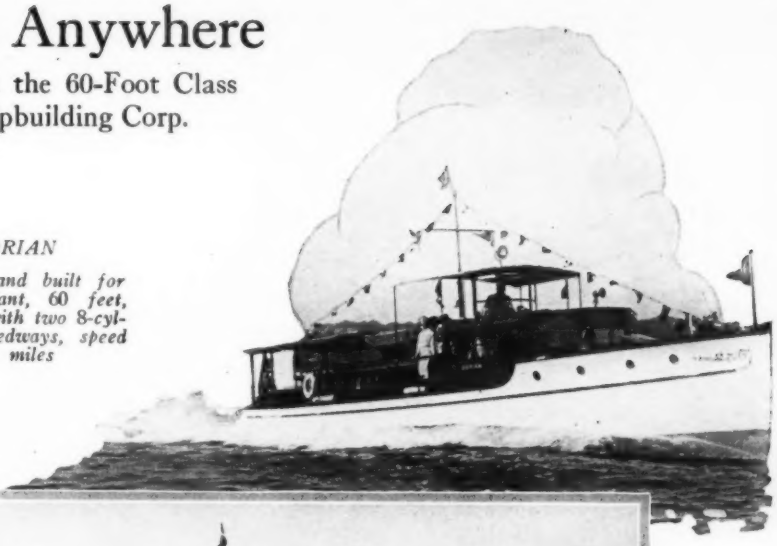
80 feet, designed and built for H. L. Judd, powered with two 6-cylinder medium duty Speedways, speed 17 miles

Will Go Anywhere

Four Cruisers in the 60-Foot Class Consolidated Shipbuilding Corp.

DORIAN

Designed and built for Henry Plant, 60 feet, powered with two 8-cylinder Speedways, speed 30 miles

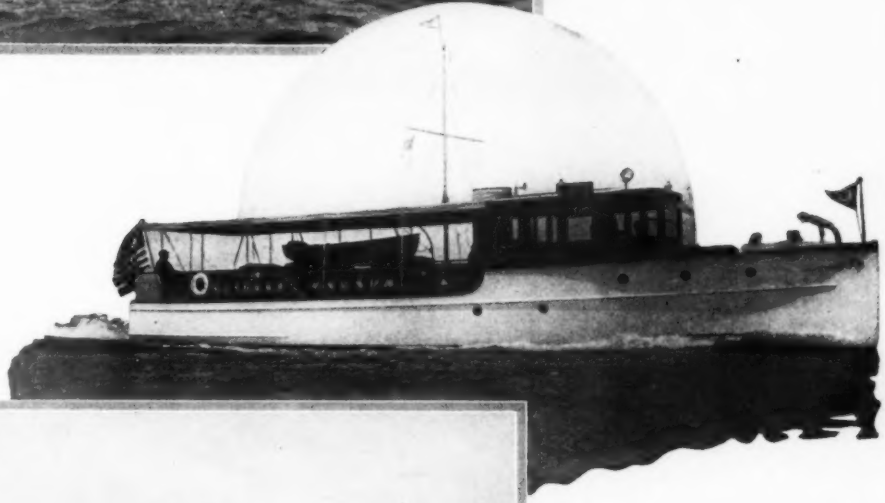


AVALANCHE

Designed and built for Anson W. Hard, 52 feet powered with one 6-cylinder Speedway, speed 16 miles

ONE THIRTY

Designed and built for Leon Goodman, 60 feet, powered with two 6-cylinder Speedways, speed 18 miles



EARLY BIRD

Designed and built for F. K. Ruprecht, 55 feet, powered with two 8-cylinder Speedways, speed 30 miles

Photographs by Rosenfeld and Wood

Photographs by Manning Bros.

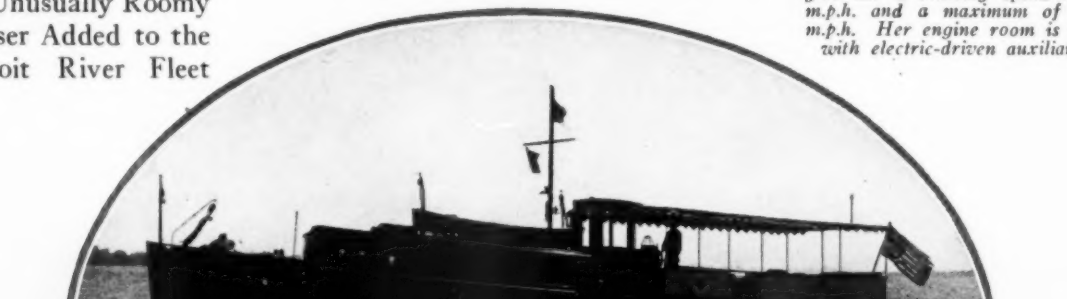
One of the handsomest of the season's additions to the Detroit River motor boat fleet is Pam, a 62-footer owned by H. C. Walker

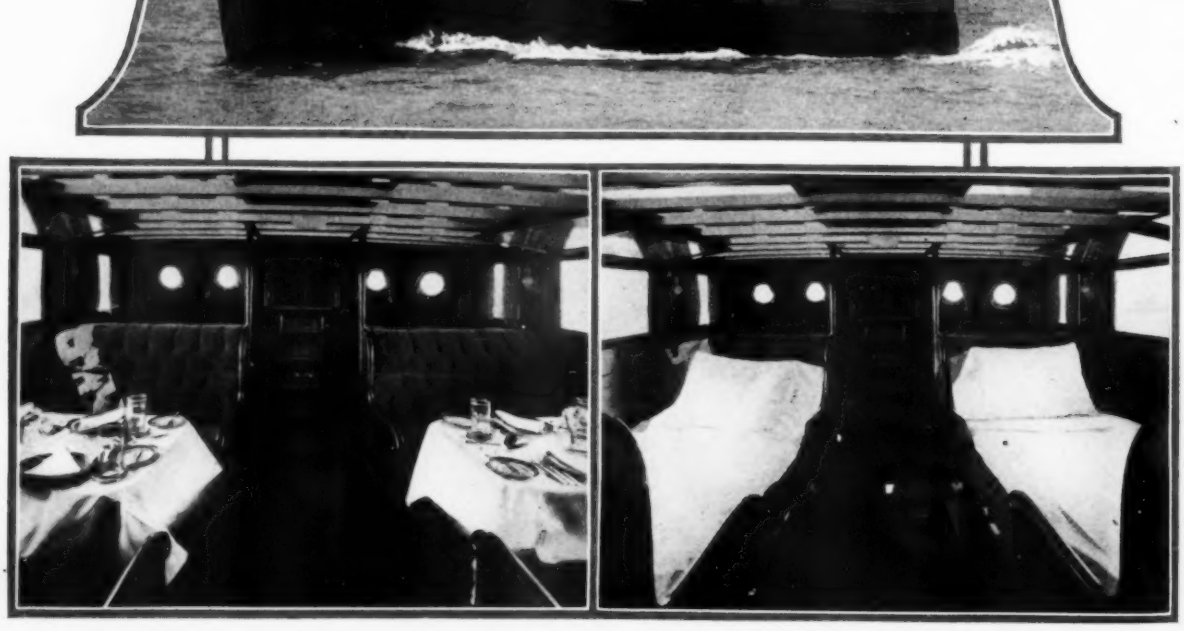
Pam was built by the Great Lakes Boat Building Corp. who have created an unusual and interesting craft

Pam

An Unusually Roomy Cruiser Added to the Detroit River Fleet

Pam is driven by a pair of 6-cylinder GR Sterling motors which give her a cruising speed of 18 m.p.h. and a maximum of 22½ m.p.h. Her engine room is fitted with electric-driven auxiliaries





The main cabin arrangement is unusual. Instead of conventional transom berths Pam is equipped with Pullman seats on each side. Small folding tables are laid between the seats for dining service which can be removed during the night

The same cabin when made up into comfortable sleeping quarters for the night. When arranged for day-time lounging the seats are sufficiently high above the floor to permit the occupant to look directly out of the cabin windows

The 40-foot V-bottom cruiser built for Dr. W. W. Plummer of Buffalo by the Richardson Boat Company

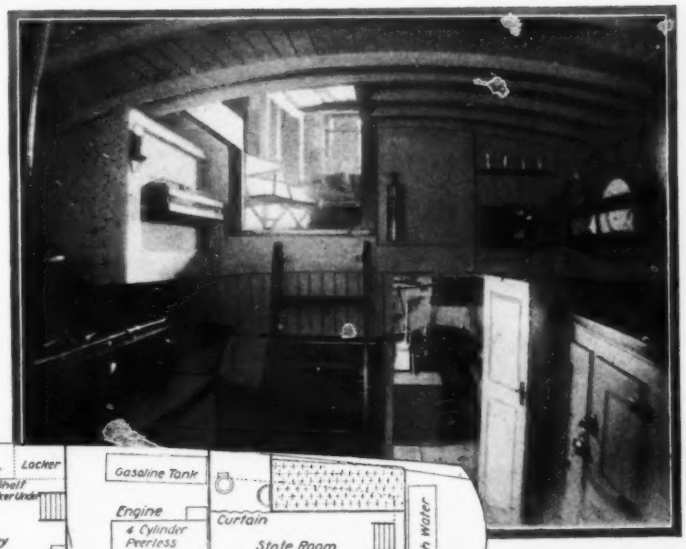
Photographs by Hauser Bob

A Model Stock Cruiser

Standardized 40-foot V-Bottom Cruiser Has Many Good Features

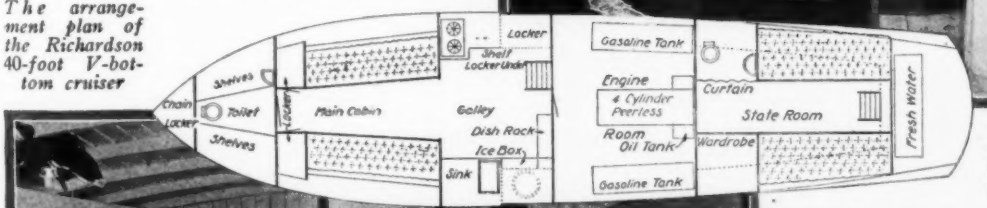
AMONG the boats completed this summer by the Richardson Boat Company of North Tonawanda, New York, can be mentioned this sturdy 40-foot by 9-foot 6-inch V-bottom cruiser built for Dr. W. W. Plummer of Buffalo, New York.

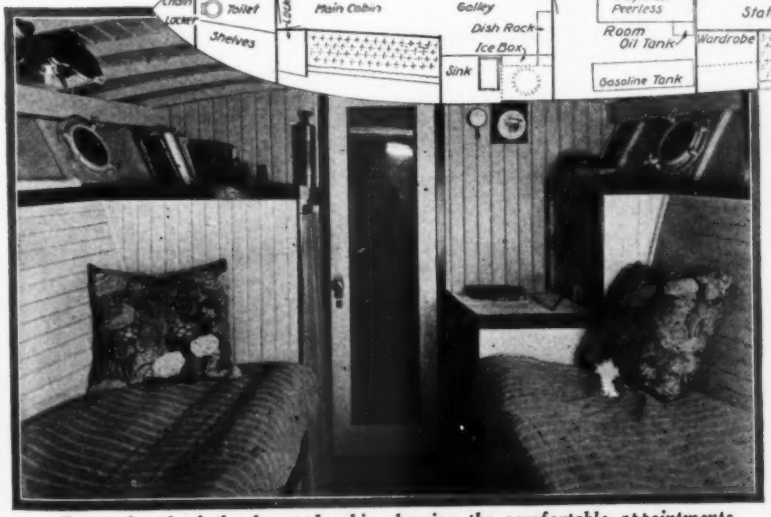
It was the particular desire of the owner to secure a substantial outfit rather than a boat with an elaborate finish and, accordingly, the interior has not been finished in the same elaborate way which characterizes many of the modern new boats. For a summer cruise this past season the owner went on a six weeks' trip through the Trent Canal system and reports that the boat has behaved beyond all expectations.



The after end of the forward cabin with a glimpse of the engine room beyond

The arrangement plan of the Richardson 40-foot V-bottom cruiser





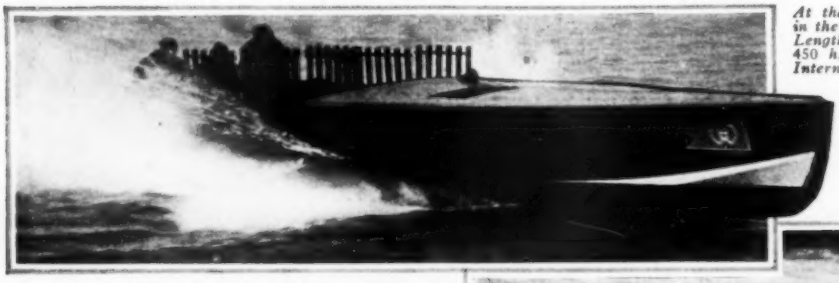
Forward end of the forward cabin showing the comfortable appointments

For the motive power a four-cylinder 5- by 6-inch Peerless Marine motor was selected, which turned a 22-inch diameter by 24-inch pitch propeller at about 675 r.p.m., and from which a maximum speed of about 12 m.p.h. was obtained. She is capable of traveling just under 10 m.p.h. with the motor reduced 100 r.p.m., and in this condition can cruise at a very economical rate. On a long trip through the canal which included forty-six locks, the fuel consumption averaged almost five miles to the gallon of gasoline.

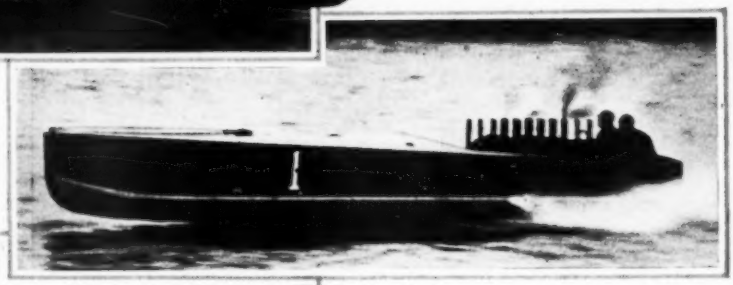
The hull is a stock model with the Richardson Boat Company and the arrangements of the interior details are generally made to suit the individual wishes of the owner or purchaser.

1921 Winners of Important Races

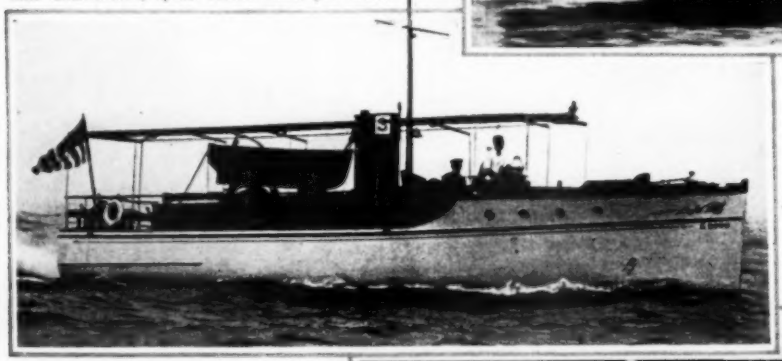
American Power-Boat Association Events Which Attracted World Wide Attention—Speed Increases Made in All Classes During Past Season



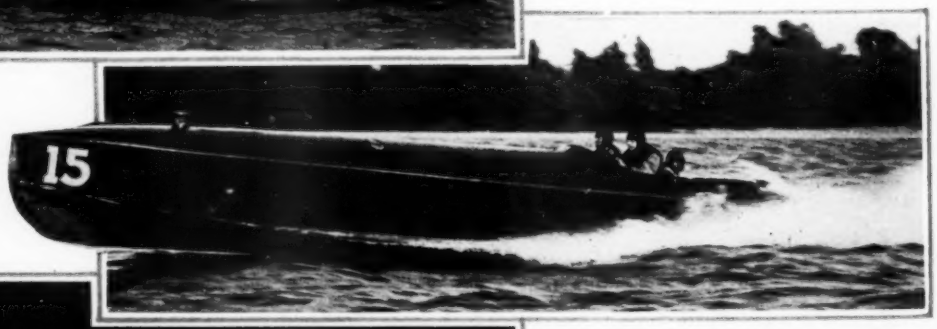
At the left—Miss America II, the fastest boat in the world. Owner, Gar Wood, Detroit, Mich. Length 32 feet, beam 8 feet 9 inches, power four 450 h.p. Smith motors. Winner of the British International Trophy and the One Mile Championship of North America. Records: British International Trophy Race, 46.06 statute miles, speed 59.8 miles per hour; best lap, 5.758 statute miles, speed 71.1 miles per hour. One-Mile Trials, average of six one-mile runs with and against the current, 80.567 miles per hour; best one-mile downstream, 81.577 miles per hour.



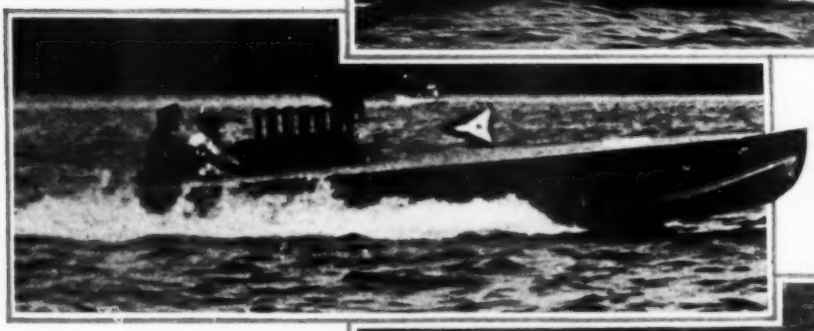
At the right—Miss America I. Owner, Gar Wood, Detroit, Mich. Length 26 feet, beam 6 feet 9 inches, power two 450 h.p. Smith motors. Winner of American Power-Boat Association Gold Cup. Records: 3 heats of Gold Cup Race, total distance 70 miles, speed 52.1 miles per hour; best heat 30 miles, speed 56.5 miles per hour; best lap 5 miles, speed 62.45 miles per hour. Mile Trials, average of six one-mile runs, speed 74.87 miles per hour; best one-mile downstream, speed 76.676 miles per hour.



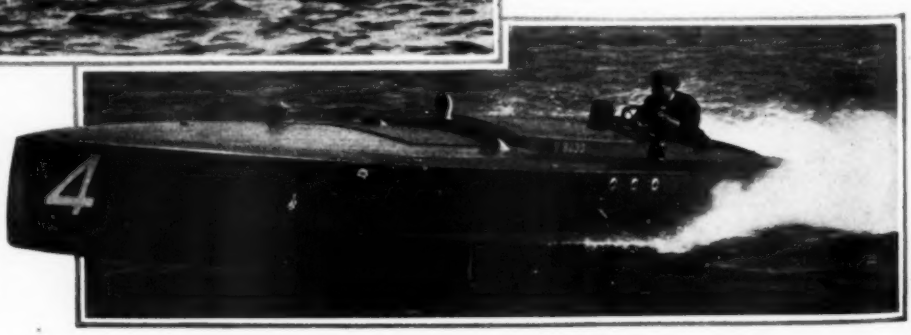
At the left—Spendthrift II, winner of New York to Block Island Race. Owners, Halsey and Van Amringe. Length 45 feet 6½ inches, beam 11 feet 3 inches, power 50 h.p. Van Blerck. Record: 100 nautical miles, speed 9.2 miles per hour.



At the right—Heldena III, owned by Fred R. Miller, Toronto, Ont. Length 32 feet, power one 450 h.p. Liberty motor. Winner of Sylvester Trophy, Canadian National Exhibition Challenge Trophy and International Displacement Trophy. Best record: 40.5 miles per hour.

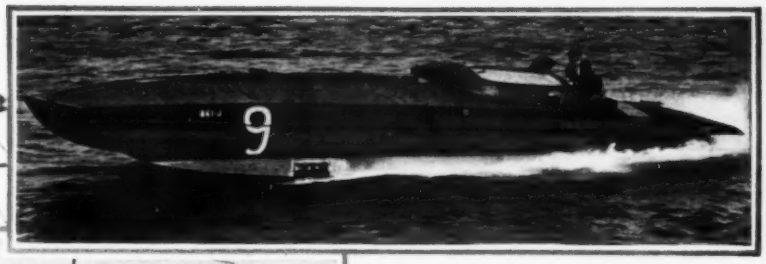


At the left—Arab IV, owned by R. H. Sidway, Buffalo, New York. Winner of Free-for-All Race of Toronto Motor Boat Club and Great Lakes International Gold Cup. Length approximately 20 feet, power one Curtiss motor. Record: Best speed in race 47.5 miles per hour.



At the right—Adieu, owned by Webb Jay of Chicago. Winner of second race for Fisher-Allison Trophy. Length 32 feet, power one 125 h.p. Hall-Scott marine motor. Record: First heat, 50 miles, speed 38.4 miles per hour; second heat, 50 miles, speed 36.8 miles per hour; third heat, 50 miles, speed 37.6 miles per hour; total race, 150 miles, speed 37.5 miles per hour; best lap 2 miles, speed 39.8 miles per hour.

At the right—Orlo III, owned by George Leary, New York City. Length, approximately 35 feet; power, in Fisher-Allison Trophy Race, two 300 h.p. Murray & Tregurtha motors; in Gold Cup Races, two 450 h.p. Liberty motors. Records: First heat, Fisher-Allison Trophy Race, 50 miles, speed 39.8 miles per hour; best lap 2 miles, speed 41.8 miles per hour. Gold Cup Races: Best heat 30 miles, speed 48.2 miles per hour; best lap 5 miles, speed 50.15 miles per hour; Mile Trials, Buffalo, average of six one-mile dashes, speed 57.799 miles per hour; best one-mile, speed 61.22 miles per hour.

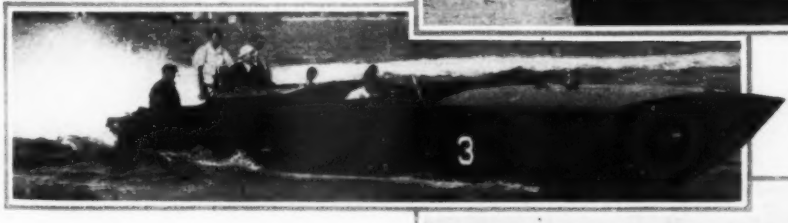


At the left—Gar Jr. II. Owner, Gar Wood, Detroit, Mich., and Miami, Fla. Length approximately 50 feet, beam 10 feet, power two 450 h.p. Smith motors. Winner of races from Miami to Palm Beach and return, Miami to Key West, Miami Express Cruiser Race in two ten-mile heats, Southern One-Mile Express Cruiser Championship, Miami to New York Run Against Time—1,257 miles. Best records: In ocean long distance race, speed 32.8 miles per hour. In Mile Trials, average of six one-mile dashes, speed 41.8 miles per hour.

At the right—Nick Nack, owned by Humphrey Birge, Buffalo, New York. Length 32 feet, power one 125 h.p. Hall-Scott marine motor. Record: Wood-Fisher Trophy Race; best lap 2½ miles, speed 42.15 miles per hour; best heat 50 miles, speed 41.3 miles per hour; entire race 150 miles, speed 40.6 miles per hour. Toronto Races: Best lap 5 miles, speed 42.856 miles

Below—Miss Liberty II, owned by Commodore Humphrey Birge, Bufffalo, N. Y. Length 62 feet, beam 12 feet, power two eight-cylinder Sterling motors. Winner of Detroit Express Cruiser Championship. Record: 24.1 miles, speed 23.1 miles per hour.

Above—Rainbow, owned by Commodore S. B. Eagan, Buffalo, N. Y. Length 32 feet, power one six-cylinder, 200 h.p. Sterling motor. Winner of third race for Fisher-Allison Trophy. Records: First heat 50 miles, speed 39.6 miles per hour; second heat 50 miles, speed 36.5 miles per hour; third heat 50 miles, speed 38.9 miles per hour; total race 150 miles, speed 38.3 miles per hour. Best lap 2 miles, speed 41.1 miles per hour; Mile Trials, average of six one-mile runs, speed 44.028 miles per hour; best one-mile, speed 45.397 miles per hour.



At the left—Orlo II, owned by George Leary, Jr., New York City. Length 32 feet, power two six-cylinder Sterling motors. Records: Second race for Fisher-Allison Trophy; best heat 50 miles, speed 38.8 miles per hour; best lap 2 miles, speed 40 miles per hour. One-Mile Trials, average of six one-mile runs, speed 47.0 miles per hour.

At the right—Turtle, owned by Thomas Farmer, Jr., New York City. Length 36 feet, beam 9 feet 1 inch, power 25 h.p. Van Blerck. Winner of American Power-Boat Association Handicap Cruiser Championship of North America. Record: 79 nautical miles, speed 10.7 statute miles per hour.

An Interesting Handicap Cruiser Race

A Novelty in Racing Events Developed by the South Shore Power Boat Club of Chicago

By G. W. Schaeffer

BELIEVING that a greater interest in the serious side of motor boating has manifested itself by the owners of cruising boats since the beginning of MoToR BoatinG's correspondence course on practical navigation of small boats, the results of a dead reckoning contest held on October 2, 1921, under the direction of the Regatta Committee of the South Shore Power Boat Club, of which the writer happens to be the chairman, may be of interest to the readers of MoToR BoatinG and to the owners of cruising boats in particular. Under the racing rules adopted by our club, all races are based upon actual performance. Probably it would be better to use the term contests, because that is what the events really amount to. In other words, the system develops efficiency in all departments of the game. The system of rating the boats was fully described in MoToR BoatinG of March, 1920. Briefly stated, every contestant is required to submit to the Regatta Committee his running time over a measured mile course expressed in seconds. This figure is used by the committee in computing the exact running time required to run a given course. The winning boat is the one which completes the run over the course nearest its computed time, based on the rating given.

Experience with this system in our club during the past two seasons has demonstrated that this method is fair to all boats no matter what the speed or power may be of the contestants—the slow, unpretentious home-built cruiser has an equal chance to win with the high-powered express cruiser. It has created greater interest in the game and opened up a desire for greater knowledge of the science of navigation.

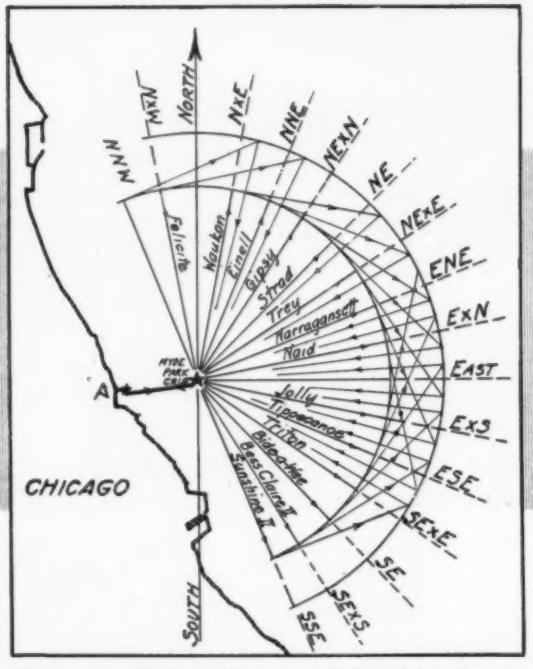


Diagram to illustrate the courses followed by the contestants in the South Shore Power Boat Club's handicap race, all courses being exactly the same length

The contest on October 2nd was held on Lake Michigan off Jackson Park and consisted of triangular courses as shown upon the sketch. Two weeks before the date of the contest, preliminary instructions were posted on the club bulletin board, reading as follows:

General instructions for dead reckoning contest to be run on the afternoon of October 2, 1921.

The accepted definition of Dead Reckoning is to find your position at sea from your last known position.

Based on the foregoing definition this contest will consist of a triangular course, of which the true compass bearing and distance of the first leg will be given. The skipper of each boat will have to compute for himself the bearings of the other two legs as well as computing the distances and time allowed in which to run them under his rating.

To introduce the sporting element of uncertainty, a sealed envelope containing the sailing instructions covering the course to be sailed will be handed to each contestant before he crosses the starting line.

Every contestant's course will be different.

On the envelope will be noted the time of departure for each contestant and the envelope is not to be opened until after the starting line has been crossed.

The common point of departure for all boats will be from the Hyde Park Crib. There will be sufficient time in the run to the crib and the run on the first leg from the crib to compute and lay-out the balance of the course.

In order successfully to follow the sailing course given in the instructions, each boat captain should have on board

(*Continued on page 72*)

Name of Boat	Rating in seconds per mile	Time of start P. M.	Computed finishing time P. M.	Actual finishing time P. M.	Running Time based on rating Hrs. Min. Sec.	Elapsed Time Actual running time Hrs. Min. Sec.	Time over or under computed running time fast or slow
Gipsy II	480	2.06	4.43.00	4.48.08	2.37.00	2.42.08	5′ 8″ slow
Jolly	480	2.06	4.43.00	4.45.54	2.37.00	2.39.54	2′ 54″ slow
Einell	450	2.16	4.43.11	4.43.18	2.27.11	2.27.18	7″ slow
Bide-A-Wee	427.5	2.24	4.43.49	4.49.26	2.19.49	2.25.26	5′ 37″ slow
Sunshine II	424	2.25	4.43.41	4.42.38	2.18.41	2.17.38	1′ 3″ fast
Naid	450	2.16	4.43.11	4.42.40	2.27.11	2.26.40	31″ fast
Narragansett	405	2.31	4.43.28	4.52.50	2.12.28	2.21.50	9′ 22″ slow
Bess Clair II	390	2.36	4.43.33	4.49.17	2.07.33	2.13.17	5′ 44″ slow

A complete summary of the dead reckoning contest held by the South Shore Power Boat Club of Chicago this fall on Lake Michigan off Jackson Park. The length of the course used was mathematically computed as 19.625 statute miles and was based on U. S. Lake Survey Chart No. 75. According to this summary the boats finishing nearest their computed times were Einell, Naid, and Sunshine II, and they were declared the winners of the contest by the Regatta Committee

There was always lots of sea along the Jamaican Coast

Divers Experiences

Hippocampus Reaches Kingston, Jamaica, and Encounters Minor Troubles of One Kind or Another—Her Skipper Reluctantly Makes an Important Decision

By Alfred F. Loomis

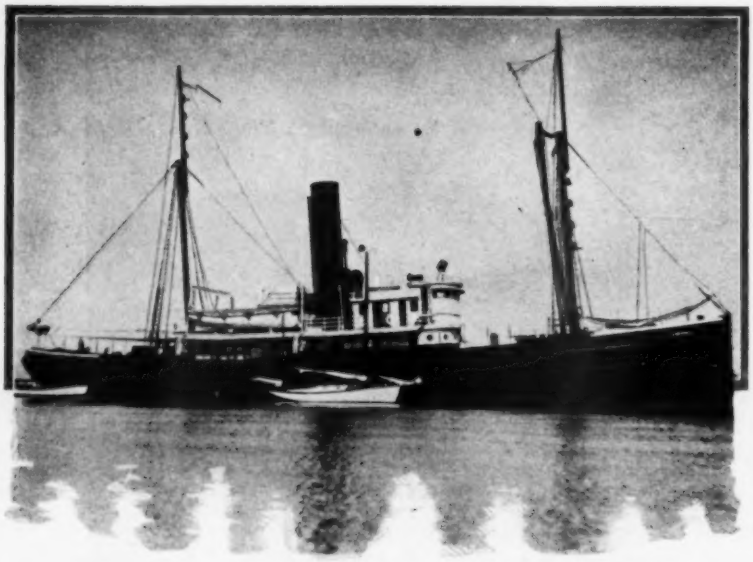
MORE than one of the numerous relatives of the crew of Hippocampus have written on receipt of a cable message, "So glad to know for the day at least that you are safe in port. Your cable gives me a feeling of security that I don't have when I know you are at sea."

We never argue the point, but if any of us were so minded he could write a most harrowing epistle on the danger of being safe in port. Before ever we put to sea we smashed our mizzen boom against a dock in Gravesend Bay, and then nearly duplicated the experience in Norfolk, being still unaccustomed to the amount of sternway that a heavily built yawl, reversing under power, will carry. One night in Charleston we parted a very necessary sternline and only missed crashing because I happened to be examining the line when it gave way. In Mayport, Fla., we had our greatest disaster of all, when an avalanche of rocks descended upon us, and in Cienfuegos, Cuba, chancing to anchor in three fathoms on the very edge of a six-fathom hole, we averted dragging into danger by our habitual good luck. And here in Kingston, Jamaica, as will presently be related, we have had our troubles.

Bananas and sugar cane, or, Why Boys Leave Home

But at Port Antonio, where we arrived on the morning of July 22, we actually were in perfect security. The harbor, a delight to the eye, is landlocked, and the trade wind, being stopped by Blue Mountain, does no more than carry showers of rain to streak fresh paint. So for three days we enjoyed untroubled minds and feared nothing. Not that we ever fear anything—to hear us talk to the swarms of visitors who came aboard while we were bending on our new suit of sails, one would have thought us the most insouciant and intrepid of mariners. We were cruising the tropics in the hurricane season; but what of it?

So we talked and puttied and boasted and varnished, and danced ashore and ate the fruits that were given us until the time came to move on for Kingston, Hippocampus rather resplendent in her new clothes and brightened woodwork. Another hour in port, I think, and one more



Hippocampus looked pretty small lying alongside the I. J. Merritt

boast, would have brought us retribution. Even leaving at that psychological moment which is familiarly known as the nick of time, we so narrowly missed a humiliating smashup that I still shudder to think of it.

The excitement came at the close of a hard day in which we had bent on the mainsail, rove a new throat halliard from native line, and made all the last-minute preparations for departure. We had bade good-by to our new-found friends and promised to hail them once more as we rounded Titchfield Peninsula —which restricts the entrance to Port Antonio and makes the western harbor the ideal anchorage that it is—and we were standing seaward in the lightest of airs, moving like a ghost through the placid dusk of late evening. It is little smooth water sailing that we have enjoyed on this cruise, and when we do get an opportunity to test Hippo's lightness of foot we sacrifice time to take every possible advantage of it.

So, drifting lazily with all sail set, we sighted the gleaming coal of a cigar on the nearby shore and called a last farewell. The ruby light disappeared and a calm voice, floating across the water, observed, "You have a motor. Why not start it?" Simultaneously Al Chambers, sitting serenely in the cockpit, tiller in hand, experienced that helpless sensation which comes when steerage way is lost, and seconded the suggestion. I dropped into the cabin and awoke the little Palmer engine to life, but, being still enthralled by the magic of the quiet night, I throttled it down to its slowest and climbed once more to my perch on the cabin house.

Peace for another moment and then Al's excited exclamation—"Gosh! (or a word to that effect.) We're being set stern first toward the rocks."

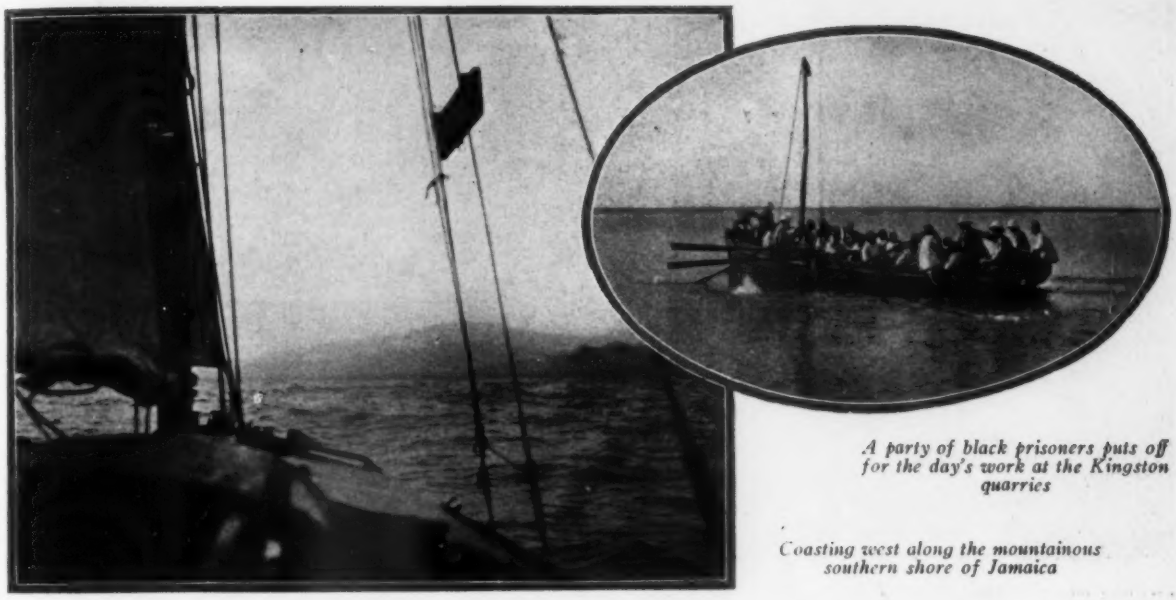
"Give her a little more gas," I said, "there's a current here that's probably carrying us down."

For an instant I was as unperturbed as I was unaware of what had happened. But when I saw the shore of Navy Island looming more distinctly astern of us I apprehended that the motor had reversed itself—and lost no time in gaining the cockpit and shifting the gear lever from the go-ahead to the go-astern position, thus reversing again the rotation of the propeller. Paul, who had been admiring the beauty of the night from the bow, had the presence of mind not to let go the anchor, and when we were almost in scraping distance of the rocks, the yawl overcame her sternway and headed slowly into the channel.

Hippocampus on the ways of the United Fruit Company at Kingston

A gang of blacks hauled us out on the marine railway

While this episode did not threaten us with physical danger it came within an ace of doing mortal injury to our pride. To have a docile, well-trained motor stop and start itself in the reverse motion, carrying one unwittingly toward a reef less than an hour after he has lightly pooh-poohed the dangers of the deep is more than the average mortal can endure, and I for one was glad when we had put the scene of our misadven-



A party of black prisoners puts off for the day's work at the Kingston quarries

Coasting west along the mountainous southern shore of Jamaica

ture far behind and were out in the broad open spaces.

Once clear of the land we shut off the motor—which, previously, had been stopped and restarted in the right direction—and whistled for the wind. For two hours it came in strength barely sufficient to hold us against the westerly current, but then it fanned itself into a sailing breeze, and by midnight we were slipping along under a single reef. The wind was against us, of course, for we were still working to the eastward, but it had the kindness to veer slightly as we neared the land, permitting a longer reach on the onshore tack.

It was our plan to make what easting we could under sail, using the motor if necessary to round the eastern end of Jamaica at nine o'clock, or before the trade wind had attained its morning strength; and to that end we made a long beat to the northeast until we could smell Navassa Island, seventy miles up the wind. Navassa, the historic home of millions of sea birds, is a lighted landmark sought by all navigators using the Windward Passage between Hayti and Cuba, and it is one of the few strategic points in the Caribbean Sea which betray their presence to the olfactory nerves.

Completely painted and back into the water in six hours

At 3:15 of the mid watch we were several miles offshore and abreast a cape known as Northeast End, from which the land falls away sharply to the southeast until it terminates at Morant Point; and there we came about, hoping rather hopelessly to round the point without further tacking. Toward daylight as we drew uncomfortably near the land the wind obligingly shifted a little to the north, and Chambers, who had the watch, was able to hold his offing by periodically luffing her. So, when the watch below came on deck at eight o'clock, clamoring for breakfast, we were agreeably surprised to see Morant Point Light and the land's end a couple of points forward of the beam.

The first appearance on deck of a morning is generally an occasion of some repressed grumpiness mitigated by a keen interest in our surroundings and the things which concern the boat's sailing. A glance around and aloft to determine the present and future condition of the sea—a question of the helmsman concerning the course and log reading—a cigarette rolled in the lee of the dinky and smoked with deep inhalations—a perfunctory application of fresh water to the face and teeth—all these things are necessary before we feel ourselves to be the equal of the one of us who has watched while we have slept. His inevitable superiority is the more keenly felt when, as on this morning, we look over the side and see the jagged bottom a few fathoms beneath us.

Yes, he's known about it all the time; has taken soundings, consulted the chart and decided that we can hold the course without lessening the depth. And so we can, but at the expense of our aplomb.

At 8:45 Morant Point Light bore abeam, and twenty minutes later, the wind freshening at the scheduled time, we had cleared the eastern extremity of Jamaica and were heading south and west. This was an event which, had we been provided with Jamaica rum, would have been duly celebrated, for, contrary to precedent and our doleful expectations, we had rounded the point without resorting to

Twisting on the diver's helmet before the descent

the motor. Moreover, we were now sailing with free sheets for almost the first time in three weeks. One has to head into wind and sea for this period of time, being constantly wet with spray, sleeping on damp blankets, and navigating under exceptional difficulties, to appreciate fully the exhilaration that we felt as we brought the wind behind us and squared away for Kingston.

For the better part of the morning I lay below luxuriating in the long lumbering rush which is a characteristic of Hippo when she is running free, enjoying the novelty of an even keel, and idly watching the spatter of drops whipped up from the sea by the main sheet to fall in iridescent sparkles through the open hatch. When in time it became my turn to take the deck I sampled another sensation—that of running before a forty-mile squall that overtook us with enveloping blackness.

Hitherto we have played extremely safe with squalls of wind, for the sails we wore were paper thin from years of usage and we had no desire to see them whipping into shreds when most we needed canvas. But now, under our new suit of 10-ounce duck, cut up and down and rather short for just such emergencies, I felt minded to experiment, and when the wind with its accompanying torrent of rain overtook us, I held her on her course. It wasn't five minutes, however, before the rain had dampened my ardor and it was all hands to the sheets to flatten her against the wind. Then the squall passed on, spending its fury against the mountainous shore of Jamaica, and we sailed once more with the wind one point on the port quarter and my eye glued to the telltale flying from the main truck. This is a dangerous point of sailing, as anyone who has jibed in a seaway will attest, and it is a careless seaman who will watch only the compass card.

Toward midafternoon another squall assailed us, and this was of sufficient strength to make lowering the mainsail not only advisable but necessary. Many salty amateur mariners have told me that they like best to sail when the lee rail is six inches under water, but they are cut from tougher canvas than we of Hippocampus. We can stand an inch or two of salt water on the lee deck, but when Paul's bible and my Bowditch go waltzing together from cabin book shelf to the bunk opposite we have an indefinable yearning that is satisfied only when something has been lowered. This time the new throat halliard, swelled by the first shower, proved refractory, and it took the combined strength of Al and me, hauling on the luff, to reeve it through the blocks. But no damage was done beyond a ruffling of our tempers, and now the throat halliard does duty as a main sheet and we have replaced it with a new line of finer stuff.

Twilight, when we wore in past Port Royal at the entrance to Kingston Harbor, saw us at the conclusion of the best day's run that we have made since leaving Key West. We had logged eighty-five miles in less than twenty-four hours, running for half the time against the wind, and we were full of satisfaction and accomplishment. The sea toward evening had assumed such proportions that we could look back a hundred feet and up to the log rotator spinning madly on the crest above us, but we were taking it easily and without danger of being pooped. Early in the cruise I asked Al if he thought it advisable to take a leaf from Nutting's notebook and batten the cabin doors against any comber that might ramble aboard over our stern. Now that I have observed the little yawl under varying conditions of wind and sea I believe that his answer to my suggestion, inconclusive as it may seem, is yet the best one—"If it ever gets that rough I don't want to be aboard."

The diving launch of the salvage tug I. J. Merritt recovers our anchors

The diver had a worried, thoughtful expression, for there are sharks in the bay

Flying alphabet flag N from our starboard spreader to apprise the authorities at Port Royal that we had already been admitted to pratique (passed quarantine, that is,) we stood in by the remnant of the city that in the days of Sir Henry Morgan was termed the wickedest on earth. Two and a half centuries ago—had Hippocampus then existed—

(*Continued on page* 102)

More Practical Questions for Motor Boatmen

Questions for MoToR BoatinG's Correspondence Course, Lesson No. 10, Piloting

Published in November MoToR BoatinG

(Answers should be sent to the Editor of MoToR Boating, 119 West 40th Street, New York, N. Y.)

ENROLLMENT in MoToR BoatinG's Correspondence Course in Seamanship, Piloting and Small Boat Handling is still open to all those who wish to enroll.

In each issue of MoToR BoatinG beginning with the last February number there has been or will be an article covering some branch of the subject. Each of these articles will form a lesson in the Correspondence Course and in the issue following the issue in which the particular lesson is printed there will be published a number of questions relating to the subject covered in the lesson.

Those enrolled in the course submit their answers to these questions at any time convenient to them. The answers are submitted by us to the examiners. The names of those who successfully pass the questions by at least 80% are published in a subsequent issue of MoToR BoatinG.

After the publication of the last article or lesson, those who have submitted answers to each lesson and have been successfully passed by the examiners, will be entitled to a MoToR BoatinG's Pilot Certificate suitable for framing, signed by the examiners and the Editor of MoToR BoatinG, certifying that the one in whose name the Pilot Certificate is issued, has successfully passed the requirements.

All that is necessary for you to enroll is to send your name at once to the Editor of MoToR BoatinG. There is no charge now or later. We have made reprints of a number of the Correspondence Course earlier lessons and have a limited supply of back numbers containing the others. We should be glad to send a complete set of the first nine lessons free of charge to any new subscriber whether he is enrolled in the Course or not.—EDITOR.

CORRESPONDENCE COURSE QUESTIONS—LESSON NO. 10

1. A light bears 4 points off bow at 10 A. M. and is abeam at 10.45 A. M. Speed of boat 12 miles an hour. How far off is light at 10.45 A. M.?
2. Course SE, bearing of light at 8 P. M. East, at 9 P. M. North East, speed of boat 10 miles an hour. How far off is the light at 9 P. M.?
3. Course E bearing of light ENE at 8 P. M., North East at 8.30 P. M. Speed of boat 10 miles an hour. What is distance from light at 8.30 P. M.?
4. In question No. 3 how far off is light when abeam?
5. In question No. 3 what time will light be abeam?
6. An object is 2½ points off bow at noon and abeam at 1.30 P. M. Speed of boat 8 knots. How far off is object when abeam?
7. Object is 6 points off bow at noon, log reads 10.5, is abeam at 12.30 P. M. with log reading of 15.5. How far off is object at 12.30?
8. In question No. 7 what is the speed of the boat?
9. Using Fig. 230 December MoToR BoatinG lay a course (or courses) from buoy B to Q (do not pass over Jackson Shoal or Duryee Middle Ground). Describe course or courses which you would lay off and follow for a night run.

Answer: Starting from Buoy B, I would head for the light buoy on The Cows, which course I would hold until light buoy E, off Matinicock Point, was abeam. I would then change my course and head directly for the light on Eaton's Neck, which course would just clear the southerly point of Duryee Middle Grounds. When I reached this point, which would be determined by cross bearings on Matinicock Point light buoy and Great Captain's Island light, I would change my course again and head directly for point Q, inasmuch as the chart shows no obstructions and plenty of water from Duryee Middle Ground to point Q. I would endeavor to check my position by the buoy off Lloyd's Neck which, although not a light buoy, should be passed close enough abeam to be seen on the average night. Point Q would be located by cross bearings taken on Lloyd's Harbor light and Green's Ledge light. This would also be checked by a 90-degree bearing on Eaton's Neck light.

(*Note:* Questions 10-25 refer to Question No. 9 and its answer.)

10. State magnetic courses you would follow.
11. State compass courses you would follow (deviation ½ point W.).
12. State true courses you would follow (variation 1 point W.).
13. State length of each leg or course.
14. State total distance from B. to Q.
15. State time to hold each course with a 10-mile boat (no current).
16. State total time to complete distance from B. to Q. (10-mile boat).
17. State magnetic directions of cross bearings taken at end of second leg on Matinicock Point light and Great Captain's Island light.
18. State compass directions of cross bearings taken at end of second leg on Matinicock Point Light and Great Captain's Island light (deviation ½ point W.).
19. State time when the light on The Cows will be 4 points off the Bow (10-mile speed).
20. State time when the light on The Cows will be abeam (10-mile speed).
21. State distance off the light on The Cows when abeam.
22. State time Lloyds Neck buoy should be abeam.
23. State time Eaton's Neck light should be 2 points off bow.
24. State time Eaton's Neck light should be 4 points off bow.
25. State distance off Eaton's Neck light when it is 4 points off bow.

Free Correspondence Course Lectures During the Winter

During the winter, probably at one of the largest clubs in New York City, there will be held, beginning in January, a series of weekly illustrated lectures, on the subject of small boat handling, seamanship, and piloting. These meetings will be open to all who care to attend. Definite announcement of dates will be made later. Those who care to enroll in the lecture course should send their names to the Editor of MoToR BoatinG so that they may be informed by mail when the arrangements have been completed.—EDITOR.

(*The names of those who have passed papers submitted during October will be found on page* 120)

Subjects Covered In Various Lessons

Lesson No.

1. Rules of the Road, Rights of Way, Proper Whistle Signals, Duty when Underway.
2. Types and Classes of Motor Boats and other Power and Sailing Vessels, Lights for All Classes of Vessels.
3. Navigation and Government Lights, Lighthouses, Lightships, Range Lights and their Characteristics and Classification, Aids to Navigation.
4. Buoys of Various Types. Colors and Numbers, Uses and Meaning. Can, Nun, Spar, Bell, Whistling, Lighted and Combination Buoys. Starboard and Porthand Buoys, Channel, Obstruction, Anchorage and Turning Buoys.
5. Equipment Required by Law for Various Types of Boats, International, Inland, Pilot and Motor Boat Rules and Regulations, Government Publications, the Light and Buoy Lists, Tide Tables, Coast Pilots, Notice to Mariners.
6. The Compass.
7. Variation, Deviation, Magnetic and True Courses, Compass Errors and their Application, Various Methods of Determining Compass Errors, Leeway.
8. The Chart, Various Kinds of Charts, Where to Obtain Them, Their Use, Various Markings on Charts, etc.
9. Nautical Instruments, the Log and Lead Line, Sounding Machines, Pelorus, Azimuth, Protractor, Parallel Rules, etc.

10 & 11. Piloting and Chart Work, Laying Courses, Determining Position by Various Methods, Allowing for Tides and Current Danger Angles.

12. Small Motor Boat Handling, Steering, Engine Room Signals, Action of Propeller. Action of Winds and Current, Shallow Water Indications, Tide Rips, Head, Beam and Following Sea, Picking up Mooring, Making Landings at a Float and Wharf, the Dinghy, Landing in a Surf, Navigation in Fog, Crowded Waters, Anchoring, Docking, Practical Aids in Boat Handling.
13. Cruising, Proper Equipment to Carry, Keeping a Log, Sun and Clock Time, Duties of Various Members of Crew.
14. Flags and Colors, Yachting Etiquette, Signalling.

Finding One's Way About in a Motor Boat

Allowance for Currents and Tides, Leeway, Speed of Boat Through Water and Over Bottom, Short Cuts in Piloting

By Charles F. Chapman

(See page 120 for names of those who passed examinations in October)

MoToR BoatinG's Correspondence Course—Lesson No. 11.

Fig. 221. More than one-half the piloting problems can be solved by a careful examination and study of the chart

Lesson No. 10 covering a part of the subject of Piloting was published in November MoToR BoatinG but as the subject is such a very big and important one it has been thought best to continue it in this issue. In this lesson we take up the consideration of tides and currents and the way to change one's compass course to allow for them. This branch of piloting has never received much attention but is not as complex or as difficult as it is generally assumed to be. The solution of all current problems can be readily solved graphically as well as by means of trigonometry but as the former method is by far the simpler we recommend this method. —EDITOR.

ONE of the most interesting problems in small boat handling and navigation which confronts the motor boatman is the question of tides and currents and their effect upon boat's speed and the courses which must be steered and the time which will be required to make good a given distance or to reach an objective point.

Contrary to the usual belief the question of tides and currents is not such a complex and confusing one as it is usually assumed to be. The subject is really comparatively simple and one which is capable of being solved readily with a considerable degree of accuracy without the use of higher mathematics.

A study of tides and currents resolves itself into three separate and distinct divisions as follows:

1. When the direction of the current is in the same direction as the boat's course or in the opposite direction.

2. When the direction of the current is at right angles to the boat's course: that is the course of the boat is across the current.

3. When the direction of the current is oblique to the course of the boat: that is, neither at right angles nor directly favorable or adverse. The question as to whether the oblique course of the current favors or retards the progress of the boat must be considered also.

Each of the above cases may be divided into three parts as follows:

a. Determination of the course to be steered to reach a certain object.

b. The time required to reach a certain object or to make good a given distance.

c. The speed of the boat over the bottom.

A problem of 1, that is: When the direction of the current is in the same direction as the boat's course or in the opposite direction, is readily solved. The speed of the boat over the bottom is in this instance simply the algebraic sum of the boat's speed through the water, or in still water and the speed of the current. In other words in a case of an 8 mile an hour boat working with a 2 mile current the net speed of the boat will be at the rate of 8 + 2 or 10 miles an hour. In the case of the same boat against an adverse current of 2 miles an hour the resultant speed of the boat over the bottom will be 8 — 2 or 6 miles an hour.

A boat goes through the water at the speed which is not affected in the slightest by the tide or current. An 8 mile an hour boat goes through the water at an 8 mile speed no matter whether she has a 5 knot current with or against her.

Winds, weather, waves and other conditions of the sea affect a boat's speed through the water but the current does not.

It hardly needs to be mentioned at this time that the compass course to be steered will not be affected in the slightest by a current which is directly ahead or directly astern. If the course to sail from one point to another is East, the course will be the same whether the current is flowing from East to West or from West to East.

Quite generally it is desired to know the time which will be required for a boat to cover a known distance, assuming that the speed of the boat in still water is known or can be calculated. To determine the time required to make good any distance it is simply necessary to divide the distance in miles and fractions thereof, by the speed of the boat over the bottom in miles per hour and the result will be the time required in hours and fractions of the hour. It is very essential that in making this calculation, the speed of the boat over the bottom be used in the calculations and not the speed through the water. As explained above the speed of the boat over the bottom is the speed of the boat in still water, plus or minus the speed of the current, depending upon whether it is directly astern or indirectly ahead.

(*Continued on page* 33)

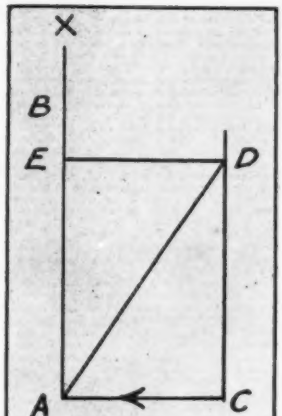


Figure 222. *Current Diagram When Sailing at Right Angles to Current. It is desired to sail from A to X; lay off on the chart, on the line AX, a distance AB equal to one hour's run of the boat in still water; lay off AC which, in direction, is opposite to the direction of the current and make the distance from A to C equal to one hour's flow of the current. From C lay off a line parallel to the course line AB and on this line locate a point D so that AD = AB. The compass direction of AD will be the compass course which must be held to sail from A to B. To calculate the time required to cover the distance from A to X draw a line from D parallel to the current line AC which will meet the line AB at E. The distance AE will then represent the speed of the boat over the bottom in miles per hour and by using this speed in the usual way to sail a distance equal to AX the time required to cover the distance is determined.*

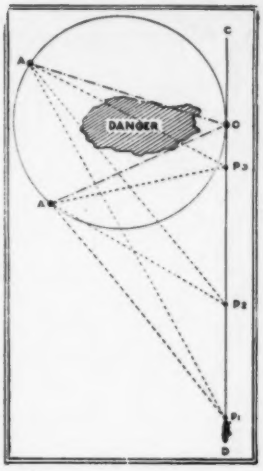


Figure 225. *The Horizontal Danger Angle.—To be sure that he will clear a charted danger such as a submerged shoal, rock or other obstruction is one of the mariner's principal worries. If he is running in sight of land on which there are two or more objects in view which can be definitely located on the chart, then the problem becomes fairly simple and he may apply the method commonly known as the Danger Angle. Fig. A illustrates this method. Points A and A' are on land or are such that they can be definitely spotted on the chart. Point O is the nearest point to the danger it is desired to approach when sailing on course C D. Point O may also be readily located on the chart. Proceed by drawing a circle through the three known points A O A'. This circle must include all portions of the danger. The angle A O A' may be measured with a protractor. Now to be sure that the danger will be safely cleared frequent bearings should be taken while the boat is on her course. If these bearings are taken at such points as P, P2, P3, etc., and the angle subtended by the objects A and A' in each instance (that is angles A P1 A'; A P2 A'; A P3 A', etc.) is less than the angle A O A', then the mariner will know that his course is safe to clear the danger which he is desirous of avoiding. However, if the angle is equal to or greater than A O A', the boat should at once sheer off to avoid the danger.*

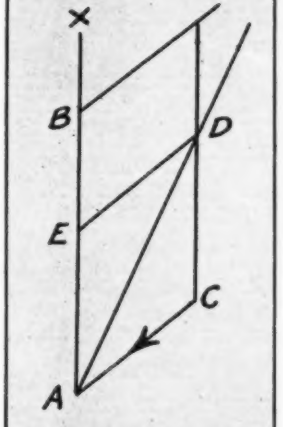


Figure 223. *Current Diagram When Direction Is Forward of Beam.—In this case as in figure 222 it is desired to sail from A to X; a distance AB is laid off on AX equal to an hour's run of the boat in still water. A line is drawn from A in the reverse direction from the current and the point C is located, the distance from A equal to an hour's run of the current; from C we draw a line parallel to AB and locate a point D on it so that AB=AD. Then the compass direction of AD will represent the direction which must be steered under these conditions. To calculate the time to go from A to X or the speed of the boat over the bottom, draw a line DE which will be parallel to AC. BE will then represent the amount which the boat has been retarded by the current, therefore, the time required to go from A to B in hours will be* $\frac{AB}{AB - BE}$ *or in other words the net speed of the boat over the bottom will be equal to AB — BE.*

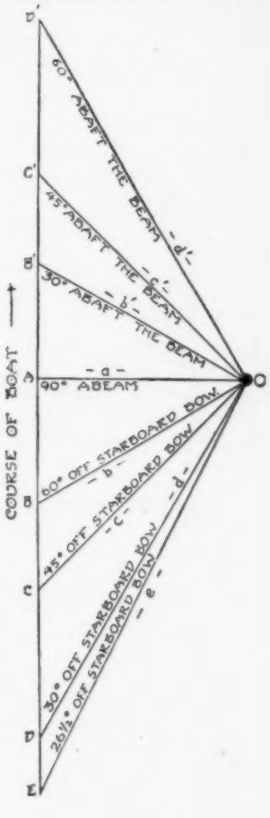
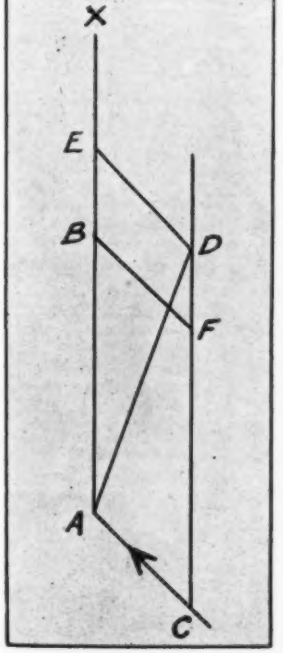


Figure 226, at the right. *Short cuts in position locating*

a = 0.9b = 0.7c = 0.5d = 1.7AB = 2.4BC = 1.4CD = 3.4BE = 1.0AC = 0.6AD = 0.5AE = 2.9BF = 0.7BE											
b = b' = 1.2a =	0.8c = 0.6d = 2.0AB = 1.6BC = 1.0CD = 4.1BE = 1.2AC = 0.7AD = 0.6AE = 3.5BF = 0.8BE										
c = c' = 1.4a =	1.2b =	0.7d	2.4AB = 1.9BC = 1.2CD = 5.0BE = 1.6AC = 0.8AD = 0.7AE = 4.2BF = 1.0BE								
d = d' = 2.0a =	1.6b = 1.4c =		3.5AB = 4.8BC = 2.8CD = 7.1BE = 2.0AC = 1.2AD = 1.0AE = 6.0BF = 1.4BE								
AB = AB' = 0.6a =	0.5b = 0.4c = 0.3d =			1.4BC = 0.8CD = 2.0BE = 0.6AC = 3.3AD = 0.5AE = 0.5BF = 0.4BE							
BC = B'C' = 0.4a =	0.4b = 0.3c = 0.2d = 0.7AB =				0.6CD = 1.5BE = 0.4AC = 0.2AD = 0.2AE = 0.4BF = 0.3BE						
CD = C'D' = 0.7a =	0.6b = 0.5c = 0.4d = 1.2AB = 1.7BC =					2.5BE = 0.7AC = 0.4AD = 0.4AE = 0.8BF = 0.5BE					
BE = 0.3a =	0.2b = 0.2c = 0.1d = 0.5AB = 0.7BC = 0.4CD =						0.3AC = 0.2AD = 0.1AE = 0.2BF = 0.2BE				
AC = AC' = 1.0a =	0.9b = 0.7c = 0.5d = 1.7AB = 2.4BC = 1.4CD = 3.4BE =							0.6AD = 0.5AE = 0.9BF = 0.7BE			
AD = AD' = 1.7a =	1.5b = 1.2c = 0.9d = 3.0AB = 4.1BC = 2.4CD = 6.3BE = 1.7AC =								0.9AE = 1.5BF = 1.2BE		
AE = 2.0a =	1.7b = 1.4c = 1.0d = 3.5AB = 4.8BC = 2.8CD = 7.1BE = 2.0AC = 1.2AD =									1.8BF = 1.4BE	
BF = B'F' = 1.2a =	1.0b = 0.8c = 0.6d = 2.0AB = 2.7BC = 1.6CD = 4.1BE = 1.2AC = 0.7AD = 0.6AE =										= 0.8BE
BE = 1.4a =	1.2b = 1.0c = 0.7d = 2.4AB = 3.3BC = 2.0CD = 5.0BE = 1.4AC = 0.8AD = 0.7AE = 1.2BF =										

Figure 224. *Current Diagram When Current Is Abaft of Beam.—In this case, as in figures 222 and 223, it is desired to sail from A to X. This case is very similar to the preceding ones with the exception that the current instead of retarding the boat's progress, though the water, more or less aids it. In this case we lay off AB equal to one hour's run of the boat in still water and from A the line AC, which in direction will be opposite to the direction of the current and the distance AC will be equal to one hour's flow of the current. Draw a line from C parallel to AX and locate point D on this line, so that AD = AB. Then the direction of the line AD will be the direction which must be steered to make good a course from A to B with a current AC. To calculate the speed over the bottom, we draw a line from D parallel to AC and meeting AX at E. The distance BE will represent the distance which the boat has been helped along in one hour's time by the current. Therefore, the speed of the boat over the bottom equals AE and the time required to go from A to*

$$X = \frac{AX}{AE}$$



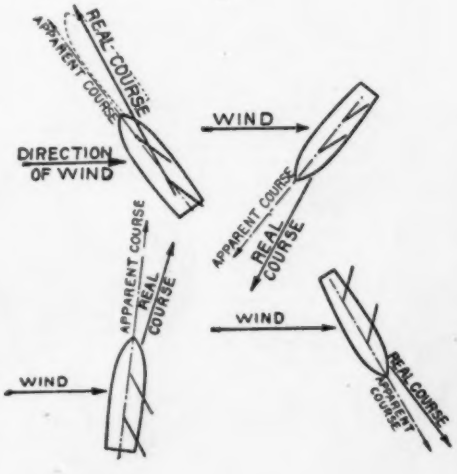


Figure 227. *Leeway is generally thought of as the sidewise movement of a vessel, but technically it is the angle between the direction in which the vessel is heading and the direction in which she is actually going. Notice that when the port side of a vessel is the windward side she is then said to be on the port tack and her leeway makes her real course lie to the right of her apparent course. Leeway on the port tack therefore has the same effect as an easterly compass error and leeway on the starboard tack has the same effect as a westerly error. The above rules hold irrespective of the direction of the wind.*

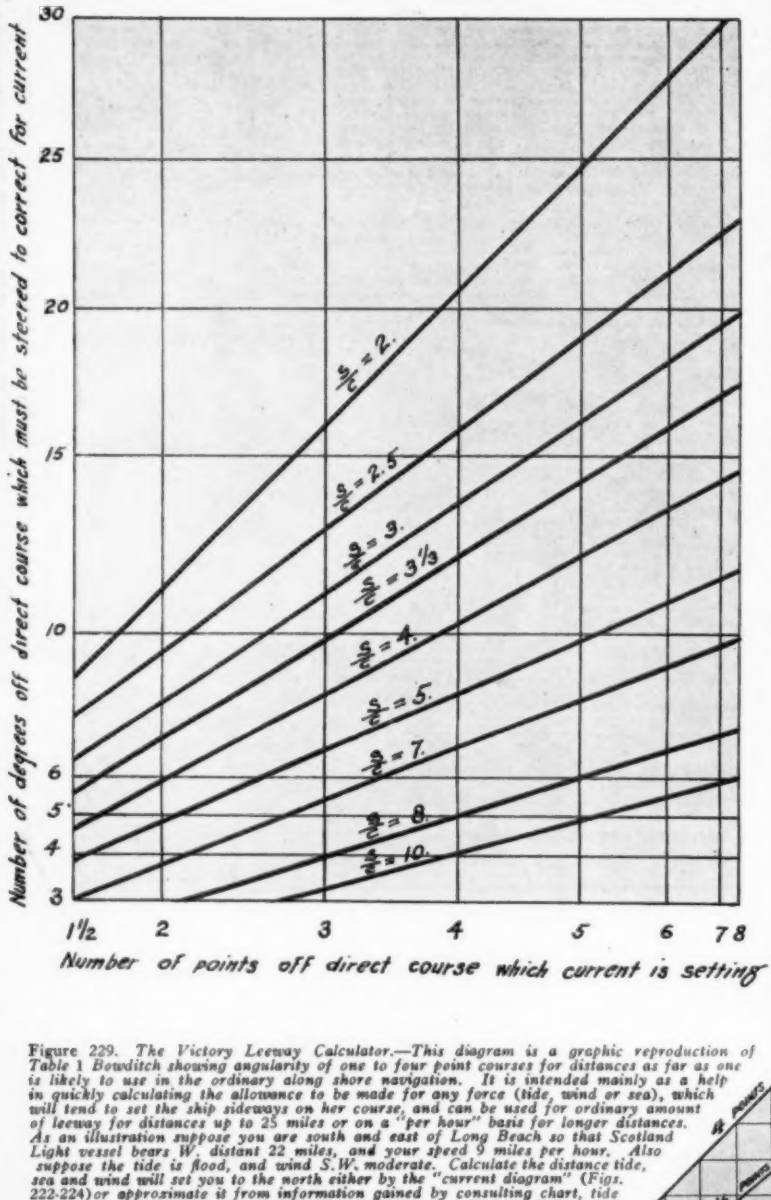


Figure 228. *Diagram for Rapidly Estimating the Amount Which Must Be Allowed for a Current Which Is Meeting the Boat's Course at Any Angle*

The amount which must be allowed in one's compass course for an oblique current depends upon two factors, in addition to the direction of the current. These two factors are the speed of the boat through the water and the speed of the current which we will call the Speed-Current Ratio and the value of which is determined by dividing the speed of the boat expressed in miles per hour by the flow of the current expressed in miles per hour. The amount which must be allowed for a given Speed-Current Ratio depends only upon the angle at which the current meets the boat's course. For example: Suppose we have a current which is meeting the boat's course at an angle of 45 degrees or 4 points, then the amount which must be allowed for this current will be the same for an 8 mile boat with a 4 mile current as it would for a 10 mile boat with a 5 mile current, as it would for a 12 mile boat with a 6 mile current, etc. In other words there would be the same allowance for all boats whose Speed-Current Ratio was 2 when the current meets at a 4 point angle.

A Speed-Current Ratio of 3 would result from such combinations as a 9 mile boat in a 3 mile current; 12 mile boat in a 4 mile current; 15 mile boat in a 5 mile current, or a 6 mile boat in a 2 mile current. The allowance which would have to be made with conditions of this kind would be the same, that is, if the current were meeting the boat's course at an angle of 6 points, the allowance in one's heading which would have to be made to take care of this angle would be the same for all conditions where the Speed-Current Ratio was 3.

A Speed-Current Ratio of 10 would result from such combinations as a 10 mile boat speed in a 1 mile current; a 15 mile boat speed in a 1½ mile current; 20 mile boat speed in a 2 mile current, etc.

The diagram at the left shows the allowance which must be made for currents meeting the boat's course at various angles from 0 to 90 degrees, bow or stern and with various Speed-Current Ratios. The figures along the bottom of the diagram indicate the number of points off the direct course which the current is setting or meets the boat's course. The figures at the left indicate the allowance in degrees which must be made to counteract for the effects of a current. For example: If we desire to sail between two points and the direct course between these two points is North and we have a current which is setting Northeast which is 4 points from North, with a 10 mile an hour boat and a 2 mile current which would give us a Speed-Current Ratio of 5, we would follow along the bottom

$$\frac{S}{C}$$

until it meets the diagonal line marked $\frac{S}{C} = 5$ *and then horizontally to the left we would see it would meet the left hand margin at a point equivalent to approximately 8 degrees. Therefore, the allowance which would have to be made in this case would be 8 degrees from North. Now as the current is flowing Northeast which would tend to carry the boat to the right of North, we must therefore, apply our 8 degrees to the left of North and steer North 8 degrees West or approximately N⅜W in order to make good our northerly course.*

If we had a case where the current was setting at right angles to our course which is 8 points, such as sailing directly across the Hudson River, in which there was an ebb tide of 4 miles an hour setting down stream and our boat had a normal speed in still water of 8 miles an hour, the Speed-Current Ratio would then be 2. Therefore, to use the diagram we would follow along the vertical line marked 8 until we came to the diagonal line $\frac{S}{C} = 2$ *which would be opposite 30 degrees at the left. Therefore, an allowance of 30 degrees or approximately 2¾ points would have to be made in one's compass course to sail across the Hudson River under these conditions. If the course across the Hudson was due West then we would have to steer 2¾ points North of West or NW 2 W¼W.*

It makes no difference in the method of calculating the course whether the current is meeting the boat's course from a direction forward of the beam or aft of the beam, as the method of determining the allowance will be the same in both cases. For example: The course which would have to be steered to allow for a current 6 points off the bow would have the same allowance which would be made for a current 6 points from the stern. However, the time required to cover a given distance would be different depending upon whether the current was forward of the beam which would retard the boat or aft of the beam which would assist the boat. The methods of calculating these times are described in figures 223 and 224.

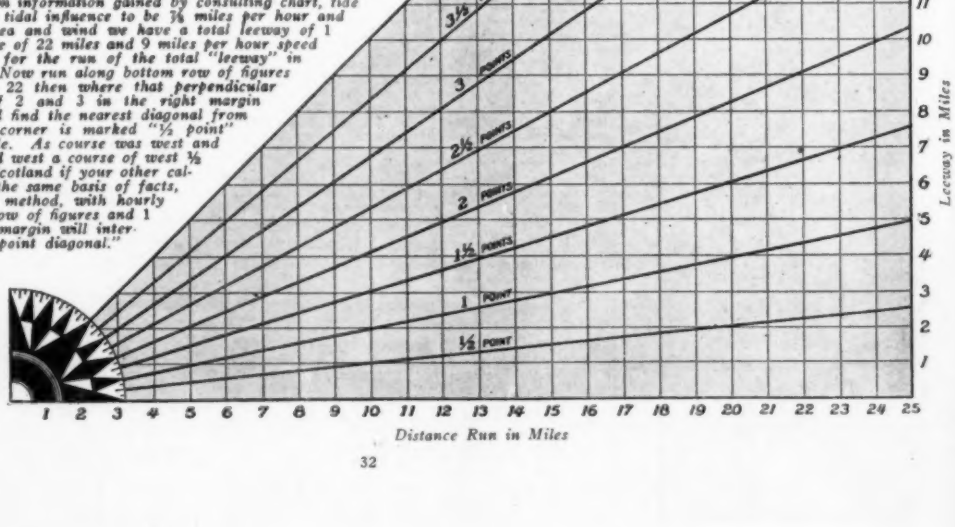


Figure 229. *The Victory Leeway Calculator.—This diagram is a graphic reproduction of Table 1 Bowditch showing angularity of one to four point courses for distances as far as one is likely to use in the ordinary along shore navigation. It is intended mainly as a help in quickly calculating the allowance to be made for any force (tide, wind or sea), which will tend to set the ship sideways on her course, and can be used for ordinary amount of leeway for distances up to 25 miles or on a "per hour" basis for longer distances. As an illustration suppose you are south and east of Long Beach so that Scotland Light vessel bears W. distant 22 miles, and your speed 9 miles per hour. Also suppose the tide is flood, and wind S.W. moderate. Calculate the distance tide, sea and wind will set you to the north either by the "current diagram" (Figs. 222-224) or approximate it from information gained by consulting chart, tide table or coast pilot. Suppose tidal influence to be ⅜ miles per hour and adding another ⅛ mile for sea and wind we have a total leeway of 1 mile per hour. With distance of 22 miles and 9 miles per hour speed it will take about 2½ hours for the run of the total "leeway" in that time will be 2½ miles. Now run along bottom row of figures (which indicate distance) to 22 then where that perpendicular crosses between the lines of 2 and 3 in the right margin (indicating "leeway") we will find the nearest diagonal from compass card in lower left corner is marked "½ point" which is allowance to be made. As course was west and the flood sets to the north and west a course of west ½ south will bring you out at Scotland if your other calculations were correct. On the same basis of facts, figuring for the "per hour" method, with hourly speed of 9 miles in bottom row of figures and 1 mile in the figures on right margin will intersect very closely to the "½ point diagonal." In the above the word "leeway" is used in a very broad sense as its regular meaning is the error caused by wind and sea only but for purposes of illustration it is made to also include the tidal or current error. This diagram could also be used to determine allowance for the tide and wind when working a Traverse table in dead reckoning.*

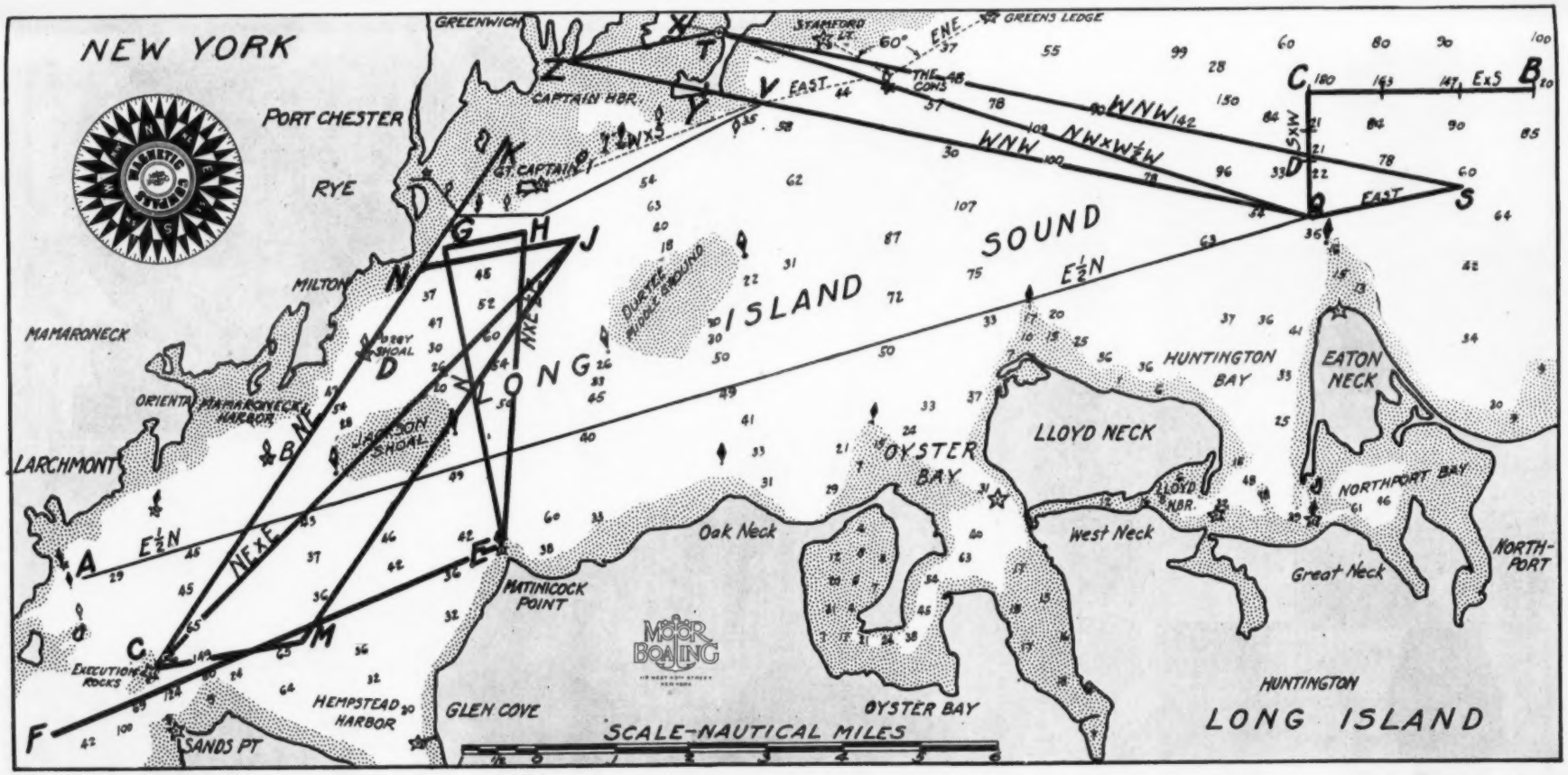


Fig. 230. See text, page 120, for full explanation

(*Continued from page 30*)

To calculate the speed of a boat it is only necessary to divide the distance run by the time in hours which was required to make the run. This gives the speed of the boat over the bottom. To this must be added or subtracted the speed of the current to determine the true normal speed of the boat through the water, depending upon whether the boat has had a fair or a head tide. For example: suppose a distance of 12 miles was covered in 1½ hours. Dividing 12 by 1½ the answer would be 8 miles which would be the speed over the bottom. Now to determine her speed through the water while making this distance, assuming a 2 mile an hour favorable current, we would then subtract 2 from 8 which would give us 6 which would be the true speed which the boat is capable of in still water. In this same case had the boat been held back by a current of 2 miles an hour in making this run of 12 miles in 1½ hours then to get her true normal speed we would add 2 and 8 and the result would be 10 miles an hour.

From the above it will be seen that it is very essential that the motor boatman have a very clear understanding of this difference between a boat's speed through the water and her speed over the bottom. In actual navigation and all problems connected with it, it is very necessary that a boat's speed over the bottom be used instead of her speed through the water. But as in the case of applying variation and deviation to one kind of course to obtain another it is very important that the speed of the current be applied in the proper direction. That is, do not subtract from the boat's normal speed when it should be added and vice versa. The consequences which might result from such errors are very evident without the necessity of further explanation.

With and Against a Current

It is generally assumed that should a boat sail up a river for a certain distance against the current, and then turn and come down the river for the same distance, her average speed in covering the whole distance will be the same as it would in slack water. However, such an assumption is incorrect as the average speed of a

(*Continued on page 86*)

Figure 231. *To make the knot at the end of a rope, take a turn round the post, keeping the end to the left.*

Figure 232. *Pass it round again to the right and pass the end through its own bight to the left as before and haul tight.*

Learn to Tie a Few Simple Hitches

A Round Turn and Two Half Hitches, the Reef Knot and the Clove Hitch

MoToR BoatinG's Correspondence Course Lesson No. 11 A

Figure 233. *To make this knot in the middle or bight of a rope or string catch hold of it as shown.*

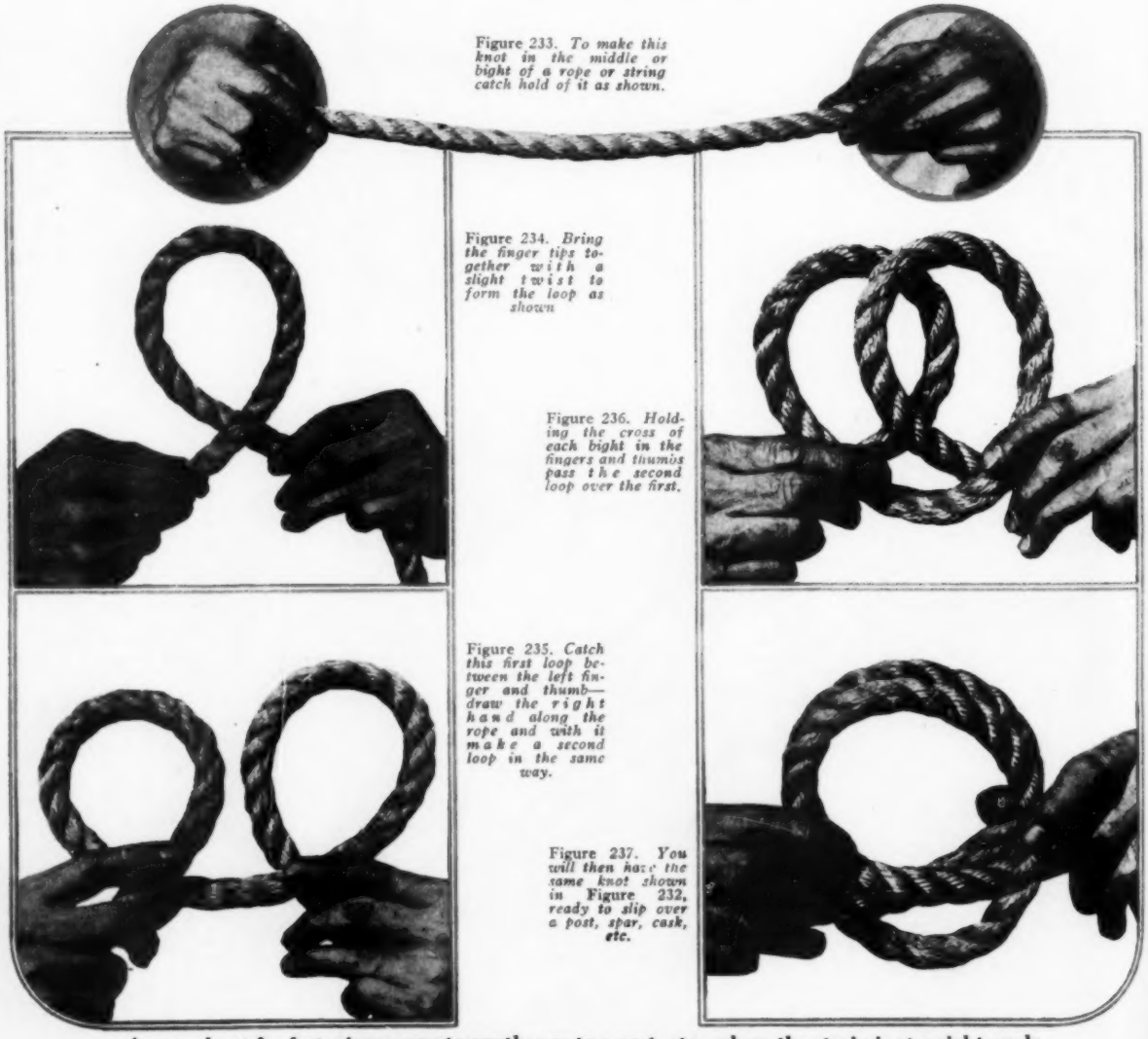


Figure 234. *Bring the finger tips together with a slight twist to form the loop as shown*

Figure 236. *Holding the cross of each bight in the fingers and thumbs pass the second loop over the first.*

Figure 235. *Catch this first loop between the left finger and thumb—draw the right hand along the rope and with it make a second loop in the same way.*

Figure 237. *You will then have the same knot shown in* Figure 232, *ready to slip over a post, spar, cask, etc.*

An easy knot for fastening a rope to another or to a post, etc., where the strain is at a right angle

A Round Turn and Two Half Hitches

A Simple and Useful Knot for Tying Up to a Ring or Post and for Many Other Purposes

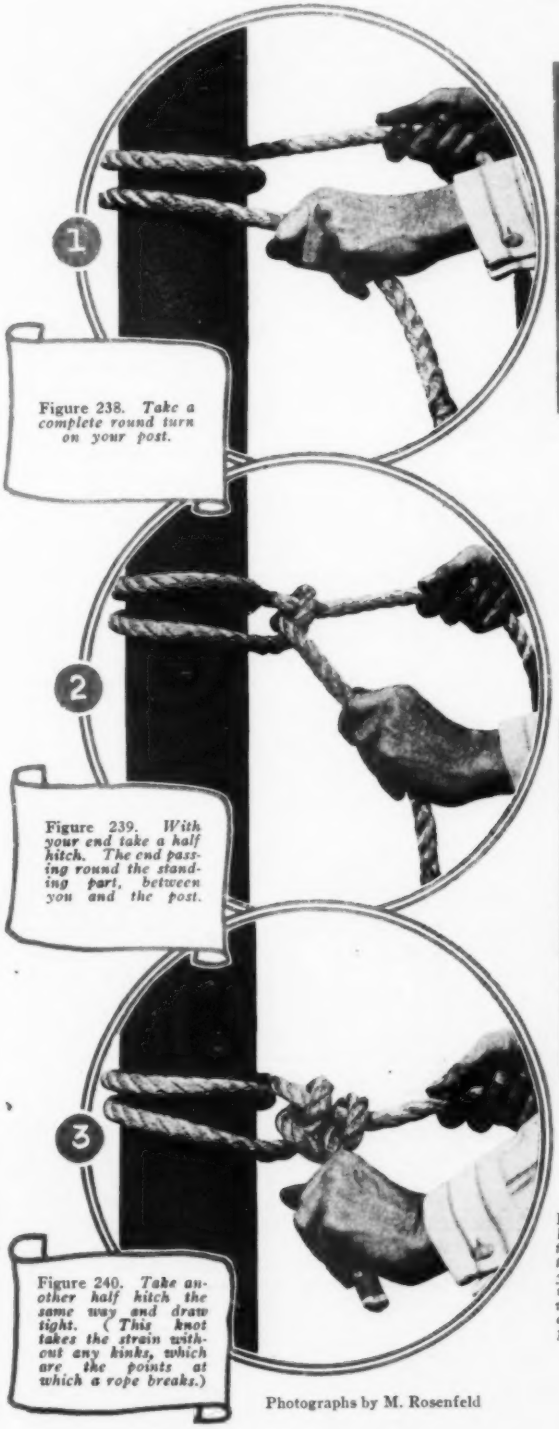


Figure 238. *Take a complete round turn on your post.*

Figure 239. *With your end take a half hitch. The end passing round the standing part, between you and the post.*

Figure 240. *Take another half hitch the same way and draw tight. (This knot takes the strain without any kinks, which are the points at which a rope breaks.)*

Photographs by M. Rosenfeld

The Reef Knot
(Square Knot)

Figure 241. *This is the most useful knot in existence. It always holds and does not jump readily. It is very simple, but must be made right. Twist the two ends as shown.*

Figure 242. *Keeping each end on its own side the black end comes up behind; keep it so and cross them.*

Figure 243. *Twist again as before and draw tight.*

Figure 244. *This is the way not to do it. The black end coming up behind as before but being crossed incorrectly in front. (In cases of accident always use this knot for a bandage as it lies flat and holds.)*

Figure 245. *When given the second twist this gives you "A Granny Knot" which is no use at all, but is far too often made.*

Winners of American Power-Boat Association Sanctioned Races During 1921

A complete summary of the winners of all races sanctioned under the rules of the American Power-Boat Association during the past season is given below. Never before have there been so many competitors to each event. Never before have there been so many successful racing events crowded into the same season. The healthy condition of the sport and the unusual activity in motor boat racing marks the season just closed as the most successful in its history. The tabulation below has been compiled with the counsel and assistance of officials of the American Power-Boat Association and is complete and authoritative in every way.—EDITOR

Boat	Rating	Belonging to	Club	Race Held By	Date	Course Miles	Time	Speed	No. of Comp.	Remarks
Gar Jr. II		G. A. Wood	Detroit Yacht Club	Miami Beach Yacht Club	February 14	129	3:55:51	32.8	3	Miami to Palm Beach and return.
Gar Jr. II		G. A. Wood	Detroit Yacht Club	Miami Beach Yacht Club	February 21	157	4:52:00	37.3	3	Miami to Key West.
Gar Jr. II		G. A. Wood	Detroit Yacht Club	Miami Beach Yacht Club	Feb. 11-12	20	0:38:06	31.5	3	Express Cruisers—Two 10-mile heats.
Adieu		W. Jay	Chicago Yacht Club	Miami Beach Yacht Club	Feb. 10-11-12	150	3:59:19	37.5	4	Fisher-Allison Trophy Race.
Orlo II		G. Leary, Jr.	Sag Harbor Yacht Club	Miami Beach Yacht Club	February 12	1		47.0		Six 1-mile dashes.
Gar Jr. II		G. A. Wood	Detroit Yacht Club	Miami Beach Yacht Club	February 12	1		41.8		Six 1-mile dashes.
Rainbow		H. Greening	Royal Hamilton Yacht Club	Miami Beach Yacht Club	February 12	1		41.8		Six 1-mile dashes.
Orlo III		Geo. Leary	Sag Harbor Yacht Club	Buffalo Launch Club	August 14	1		57.799		Six 1-mile dashes.
Rainbow		S. B. Eagan	Buffalo Launch Club	Buffalo Launch Club	August 14	1		44.028		Six 1-mile dashes.
Rainbow		S. B. Eagan	Buffalo Launch Club	Buffalo Launch Club	Aug. 11-12-13	150	3:54:44	38.3	9	Fisher-Allison Trophy Race.
Gar Jr. II		G. A. Wood	Detroit Yacht Club	A. B. P. A	April 25-30	1,257	47:15	26.6		Miami to New York Run Against Time.
Gar Jr. II		G. A. Wood	Detroit Yacht Club	A. P. B. A	April 25-May 5	2,036	80:36	25.4		Miami, Fla., to Detroit, Mich.
Miss America I		G. A. Wood	Detroit Yacht Club	Detroit Yacht Club	Aug. 27-29-30	70	1:20:28	52.1	3	A. P. B. A. 40-foot Class, for Gold Cup.
Miss America II		G. A. Wood	Detroit Yacht Club	Detroit Yacht Club	September 6	1		80.56	3	One-Mile Championship of North America.
Baby Gar		G. A. Wood	Detroit Yacht Club	Detroit Yacht Club	Aug. 27-29-30	150	3:31:17	42.6	4	Wood-Fisher Trophy Race.
Miss Liberty II		H. Birge	Buffalo Launch Club	Detroit Yacht Club	August 28	24.1	1:02:34	23.1	4	Express Cruiser Race.
Miss Chicago		Sheldon Clark	Chicago Yacht Club	Detroit Yacht Club	Aug. 27-29-30	70	1:29:15	47.1	3	Single Engine Hydroplanes.
Bee		C. F. Bornman	Detroit Yacht Club	Detroit Yacht Club	August 28	15	0:28:33	31.55		Free-for-All Runabout.
Spendthrift II	42.36	Halsey & Van Amringe	Larchmont Yacht Club	New York Athletic Club	July 9	100*	10:55:00	9.2	4	Handicap Cruiser Championship, L. I. Sound, Class A.
Kodak	35.09	R. J. Haslinger	Hudson River Yacht Club	New York Athletic Club	July 9	100*	20:46:00	4.8	4	Handicap Cruiser Championship, L. I. Sound, Class B.
Turtle	38.1	T. Farmer, Jr.	New York Athletic Club	New York Athletic Club	August 6	70*	8:34:23	10.7	12	Handicap Cruiser Championship.
Viva	35.22	A. Pettit	Tamaqua Yacht Club	Hudson River Yacht Club	September 11	44*	5:40:49	7.75	9	Handicap Cruiser Championship—Hudson River.
Viva	35.22	A. Pettit	Tamaqua Yacht Club	Tamaqua Yacht Club	September 18	45*	5:45:32	7.8	15	Handicap Cruiser Championship—New York Bay.
Orlo II		Geo. Leary, Jr.	Sag Harbor Yacht Club	Miami Beach Yacht Club	February 11	2	0: 3:00	40.0	4	Best Lap Second Fisher-Allison Trophy Race.
Orlo II		Geo. Leary, Jr.	Sag Harbor Yacht Club	Miami Beach Yacht Club	February 11	50	1:17:35	38.8	4	Best Heat Second Fisher-Allison Trophy Race.
Orlo III		Geo. Leary	Sag Harbor Yacht Club	Buffalo Launch Club	August 11	2	0: 2:52	41.6	9	Best Lap Third Fisher-Allison Trophy Race.
Orlo III		Geo. Leary	Sag Harbor Yacht Club	Buffalo Launch Club	August 11	50	1:15:27	39.8	9	Best Heat Third Fisher-Allison Trophy Race.
Baby Gar		G. A. Wood	Detroit Yacht Club	Detroit Yacht Club	August 30	50	1:07:52	44.24	4	Best Heat Wood-Fisher Trophy Race.
Arab IV		R. H. Sidway	Buffalo Launch Club	Toronto Motor Boat Club	September 5	10	0:12:38	47.5	3	
Nick Nack		H. Birge	Buffalo Launch Club	Toronto Motor Boat Club	September 1	10	0:14:54	40.2	3	Schnaufer Cup.
Nick Nack		H. Birge	Buffalo Launch Club	Toronto Motor Boat Club	Sept. 1 & 2	30	0:46:47	38.4	3	Freysing Cup.
Heldena III		F. R. Miller	Toronto Motor Boat Club	Toronto Motor Boat Club	Sept. 2	10	0:14:48	40.5	4	Sylvester Trophy.
Claire III		A. Rogers	Toronto Motor Boat Club	Toronto Motor Boat Club	Sept. 5	20	0:31:19	38.4	5	Int. Disp. Gold Chall. Trophy.
Miss Toronto II		Miss Toronto Syn'cate	Toronto Motor Boat Club	Toronto Motor Boat Club	Sept. 5	25	0:26:12	57.2	4	Canadian Int. Gold Challenge Trophy.
Heldena III		F. R. Miller	Toronto Motor Boat Club	Toronto Motor Boat Club	Sept. 5 & 6	30	0:47:14	38.1	5	Canadian Nat. Exhibition Chall. Cup.
Arab IV		R. H. Sidway	Buffalo Launch Club	Toronto Motor Boat Club	Sept. 7	15	0:18:56	47.5	3	Great Lakes International Gold Cup.
Heldena III		F. R. Miller	Toronto Motor Boat Club	Toronto Motor Boat Club	Sept. 6	20	0:31:53	37.6	5	International Displ. Trophy.

* Nautical Miles.

A. P. B. A. Makes Important Changes in Racing Rules

Action Taken at Annual Meeting Which Will Assure Greater Racing Activity—New Rules for Gold Cup, Fisher-Allison and Wood-Fisher Races—Ban on Cash Prizes Removed

THE cause for that which has been a Tempest in a Teapot for many, many years has been removed.

After all, it doesn't much matter what form a man's reward for winning a motor boat race is in. Men have lived who have spent a fortune to win a piece of blue ribbon. There will be others in the future who will do the same. And again we have many living today who wouldn't spend five dollars unless they thought they had a chance to win a thousand. And so it goes. One year in the 270-mile race of the New York Motor Boat Club there were 23 starters and the first prize was valued at less than $50. Another year with a prize worth four times as much there were no starters. In the free-for-all race at this year's Chicago Pageant of Progress races, where the stake was $1,000 and a silver trophy valued at perhaps a like amount, there were two starters in the first heat, one in the second and none in the third, although there were proportionate cash prizes for second, third and fourth and any number of boats eligible. In a recent race at Detroit the first prize in one of the events was worth $700, and it is reported that the winner returned it to the jeweler who had presented it with the request that he give him the cash instead.

So in view of such conditions and many more in addition, the American Power Boat Association at its Annual Meeting, held recently in New York, saw fit to modify its long established stand on the question of prizes and the disqualification of those who race for cash. As a matter of fact, the American Power Boat Association never had a rule forbidding the giving of cash prizes, although it was generally claimed by their opponents that their objection to this association was based solely on the cash prize angle which the latter always assumed. The Association has come in for, in times gone by, much uncalled for and unfavorable newspaper and magazine criticism every time anyone objected to any of the American Power Boat Association officials or supporters or when anyone was jealous of this organization's success. The cash prize was always given as the cause. Whenever anyone lost a race and looked around for the reason, it was generally found that the American Power Boat Association's stand on the cash prize was the cause. Whenever a new organization was formed—and there have been many of them—it was for "freedom of prizes." If one needed publicity to elevate him to fame he chose the cash prize route. Club officials defeated for office saw return to glory by the cash prize plank. And now those who have so strenuously worked this much overworked camouflage will have to seek new excuses. No doubt that will not be difficult.

But it wasn't on account of any of the above reasons that led the American Power Boat Association to cast overboard the Tempest in the Teapot. It was because those present at the Annual Meeting, after a full discussion, thought that in the interests of racing and motor boat development the time had arrived to take this action. There were no steam roller tactics, not even a prearranged program. Probably no group of interests had any intention of suggesting the change in the amateur rule until the meeting was half over and a special opportunity presented itself based on a suggestion contained in the report of the Racing Commission.

This year's Annual Meeting was harmonious in the extreme. Perhaps more was accomplished for the good of the sport than ever before. Not a motion was lost and with a single exception they were carried unanimously. The single exception had one opposing vote. It was give and take by all. Those from the West needed the support of those from the East to put through the action they desired and the East needed the West to accomplish their points. All sides were in accord.

The American Power Boat Association's future policy will not be radically different from the past. There will be no intention to promote cash prize races, neither will anything be done to prevent them. The solution of the proper prizes will in the future be left, as it has been in the past, to the individual localities and clubs. It is doubtful whether cash prize racing will be any more extensive in the future than formerly. The American Power Boat Association classics will remain the same.

Just this will be different—there will be no ban placed by the American Power Boat Association upon boats or owners who may have raced for cash in the past—all that gum-shoe work which has been resorted to, to "fool the officials" will be eliminated. The evasion of the rules which has been so easily accomplished and which, nine times out of ten could not be detected and never enforced, will be wiped out. All of this will help racing, particularly in the middle west where there has existed much difference of opinion on the question of proper prizes.

Another matter which was fully discussed and passed upon was the question of revising the Deed of Gift governing competition for the famous Gold Cup, which has been raced for annually since 1904, in such a way that the entry list would be larger and the competition more keen than it has been in the last several years. It is a fact that probably nothing has influenced the development of boats and engines more than have these classic races for the Gold Cup in the past.

With the motor boat Standard winning the first race in 1904 at the then unheard-of speed of 23.6 miles an hour, speeds have gone constantly up until the record was made in 1920 when Miss America I covered one 30-mile heat at a speed of 70 miles an hour.

However, interest in the Gold Cup Race from the standpoint of number of entries has been constantly diminishing since the 1915 race, which was held on Manhasset Bay and in which there were 14 entries and 9 starters. With the increase in speed came a much more expensive boat, both in first cost and in maintenance, as well as calling for more daring on the part of the driver and mechanicians. These conditions did much to limit interest in the Gold Cup Races to a very few. This led the meeting to take action which for the 1922 race will bar hydroplanes altogether and limit the entries to displacement boats having a waterline length of not less than 25 feet and a waterline beam at their widest part of not less than 5 feet and powered with a motor of not over 625 cubic inches.

MoToR BoatinG believes that this change is a decided step in the right direction. The sizes decided upon at the Annual Meeting will prove very popular both as regards

(*Continued on page* 112)

The seventeenth National Motor Boat, Ship and Engine Exposition will be held in the Grand Central Palace, New York, February 17 to 25, 1922.

DATES FOR AMERICAN POWER BOAT ASSOCIATION

SOUTHERN RACES:

Cruiser Race, Miami to Palm Beach and return, Saturday, Feb. 11.
Cruiser Race, Miami to Key West, Saturday, Feb. 18.
Cruiser Race, Miami to Havana, Saturday, Feb. 25.
Races for the Fisher-Allison Trophy, Miami, Thursday, Friday and Saturday, March 2, 3 and 4.
Races for the Wood-Fisher Trophy, Miami, Tuesday, Wednesday and Thursday, March 7, 8 and 9.

NEXT SUMMER'S RACES:

Pageant of Progress Races, Chicago, July 24 to Aug. 5.
Regatta at Buffalo, Aug. 10, 11 and 12.
Fisher-Allison Races, Hamilton, Ontario, Aug. 17, 18 and 19.
Wood-Fisher Races, Detroit, during the period from Aug. 26 to Sept. 5.

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the February Prize Contest

1. Describe the construction of a folding or removable glass wind and spray shield for a small cabin cruiser.

(Suggested by H. H. P., Oakland, Cal.)

2. Explain the construction of a suitable motor boat hauling rig for a small boat club.

(Suggested by W. B. M., Newburgh, N. Y.)

Rules for the Prize Contest

ANSWERS to the above questions for the February issue, addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before December 25, (b) about 500 words long, (c) written on one side of the paper only (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before December 25. The Editor reserves the right to make such changes and suggestions in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Constructing a Simple Blinker Signaling Device

Clever Devices Suggested by Readers for Constructing Communicating Lamps to Permit Signaling Between Yachts at Night

Answers to the Following Questions Published in the October Issue

"Give drawings showing construction, connections and method of installation for a blinker signaling device, so that the boatman could communicate with nearby yachts during the night"

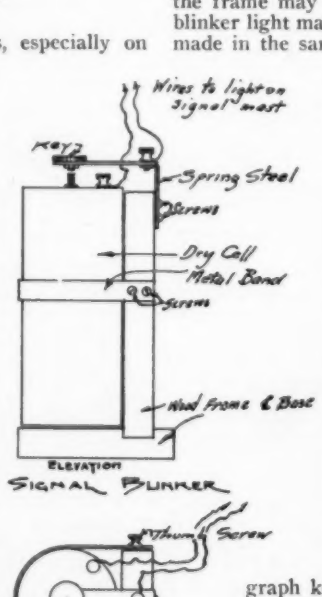
The Simplest Device

(The Prize-Winning Answer)

ANY signaling device for use on boats, especially on the smaller craft, should obviously be independent of machinery or other equipment used for any other purpose; for it may so happen that an unforeseen disability of such machinery or equipment would make the immediate use of the signaling device necessary.

The signaling device should be of the simplest possible construction consistent with strength to stand rough handling. Connections for such a device would depend on the type of boat on which it is to be used. If the boat carries a signal mast, the light for the blinker should be carried well up on the mast to give it increased range. But in boats too small for a permanent mast, the device should be of such construction as to make it an independent portable unit.

It would be hard to conceive of a blinker signaling device simpler than that shown in the accompanying sketch. It consists of a simple wood frame and base of the proper size to serve as a stand for the dry cell batteries purchasable anywhere. The stand carries a metal band fastened rigidly at one end to the frame and clamped at its other end to the frame with a thumb nut. The purpose of this band is to hold the battery rigidly in position on the frame or stand. The stand carries fastened rigidly to it at the top a piece of spring steel terminating in a key over a pole of the battery.



Simple signalling device designed by H. O. B.

If the device is to be used on a signal mast light, wires from the light should lead, one to the electrical connection on the key and the other to the unused pole of the battery.

If a strictly portable device is desired, the wooden back of the frame may be extended to any desired height and the blinker light may be mounted thereon, the connections being made in the same manner, however.

The possibilities for convenient installation of the device shown seem practically unlimited.

H. O. B., Charleston, S. C.

A Double Purpose Lamp

FOR obvious reasons, it is worth while in selecting motor boat accessories to consider all the different purposes to which the device or tool might be put. By doing this a part may often be made to serve a double purpose.

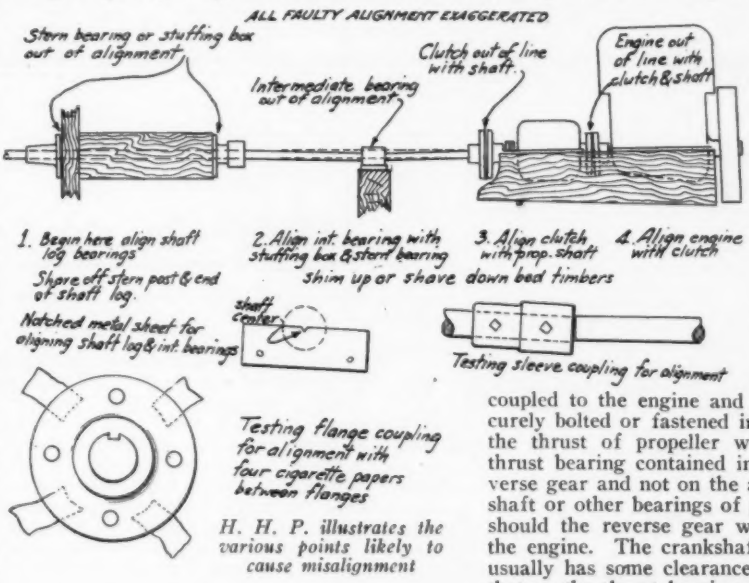
Thus in the blinker system shown in the sketch we can utilize a standard trouble lamp for signaling and still have it available for use about the boat. A trouble lamp of the type shown should be selected. This, it will be noted, has the bulb projecting out of the reflector with a wire guard for protection against breakage. The length of cord is best determined by conditions, but ten feet is about right. The cord carries an attachment plug.

The signaling key is an ordinary telegraph key and may be purchased from a dealer for a small sum. Some keys come mounted on a wood base, while for others, a piece of finished board must be provided. The key also must have a few feet of cord with an attachment plug.

Three plug sockets are shown, but this is a matter of opinion. One may be located at the base of the mast or anywhere outside toward the bow. Another may be placed in the cockpit, while the third may be anywhere within the cabin. A dry or storage battery is used to supply current. The sketch shows the connections, and it will be noted that the lamp may be plugged into

aligned shaft, the flanges should push together evenly all around. In the case of a badly aligned shaft, the edges of the flanges will also be offset when brought together.

Assuming that the installation consists of a wooden shaft log with stern bearing and stuffing box, an intermediate shaft bearing (pillow block) bolted to a floor timber, a separate clutch bolted to the engine timbers, and that all or part of them are out of line somewhere, the first thing to do is to disconnect the engine-clutch and clutch-propeller shaft couplings, then loosen the intermediate bearing bolts. The movement of the flanges when separated a trifle will give an indication as to where the trouble lies. First the shaft log bearings must be tested and aligned, then the intermediate bearing, clutch and lastly the engine. If there is no intermediate bearing and if clutch and engine are integral, the problem is that much simpler. With intermediate bearing loosened, turn propeller shaft; if stiff, loosen stuffing box packing, and if it still turns hard, probably one or both bearings are out. Loosen shaftlog and stern post bolts and see if bearings set square against the timbers. If not, shave off one side until everything bolts up fair and the shaft turns easily by hand. If the shaft is of considerable length, the best way to align the intermediate bearing is to remove the propeller shaft altogether, leaving the shaftlog bearings in place; clamp three notched metal sheets across the ends of the three bearings with the notches exactly in the center of the shaft line, run a fine steel or copper wire through the notches of stern bearing and stuffing box jigs, stretch wire tightly and secure inboard end. Then bring up the intermediate bearing until its notch exactly enters the wire; two jigs, one at each end of the bearing, would increase the accuracy of the alignment. Then shim up the bearing base, or shave down the top of the floor until the wire exactly enters the notches with all bolts hard down; remove jigs and wire, replace shaft, test for easy rotation and we are ready to align the clutch.



H. H. P. illustrates the various points likely to cause misalignment

As mentioned above, the operation is greatly facilitated by the presence of the flange type coupling; the sleeve type must be tested by running back the shaft, clear of the hole, and then observing whether it enters easily. If it will not, or binds at the side immediately upon entering, the two shafts are out. A flange coupling is tested by bringing the flanges almost together and then inserting four thin sheets of paper, preferably cigarette paper, around the edges. Press the flanges together and pull out the papers; if some draw easily, while one or two stick, alignment is not perfect and the shimming or timber shaving must continue. Always shim up so that the clutch or engine base is a trifle high, then when the bolts are set up tight it will be drawn down to the right position.

As each unit is aligned and bolted down, test by turning over by hand, for easy running, before proceeding to the next, the engine itself being the last to be attended to. If the aligning is performed on land, this should be checked up again when in the water, as a hull, especially one lightly built, often changes its shape when launched.

When the base of motor or clutch has to be raised but a small amount, sheet brass or iron is best for the shims and they should cover a fairly large area to prevent them being forced down into the bed timbers; a space of an eighth of an inch or over is usually filled by hardwood strips cut to fit; it is poor policy to shim up with washers under the holding down bolts as these do not offer sufficient bedding surface.

H. H. P., Oakland, Calif.

Test with Thickness Gauge

ABOUT the easiest and most satisfactory way to test out the engine, reverse gear and propeller shaft for alignment is by using a thickness gauge or feeler between the faces of the flange couplings connecting these parts.

To do this, loosen, or even better, entirely remove the bolts that hold the couplings together. Separate the couplings slightly so the gauge will just go between them and try the gauge at different points. If the gauge has about the same feel all the way around and just rubs so it can be moved easily, the alignment may be considered satisfactory; but should the gauge go in freely on one side and be tight on the other, then the alignment is faulty and the engine must be moved in the direction indicated to bring the coupling faces exactly parallel. It may be necessary to slack up the bolts and raise the engine or clutch by placing metal shims or other liners below the lugs, or it may even be necessary to move the engine sideways. Of course, the coupling is tested out from time to time to determine when the engine has been located in the correct position; then all the hold down bolts are tightened and the final test made with the engine and clutch firmly bolted down.

Where the reverse gear is a separate part, not a unit power plant, care should be taken to push it as far aft as possible after it is coupled to the engine and then it should be securely bolted or fastened in this position so that the thrust of propeller will come on the ball thrust bearing contained in the after end of reverse gear and not on the arms of engine crankshaft or other bearings of gear as would happen should the reverse gear work forward towards the engine. The crankshaft of a marine engine usually has some clearance or end movement so that as the thrust bearing and other parts wear, the thrust or load will not come on the engine shaft.

Frequently, when the bolts are entirely removed from the coupling, the propeller shaft will spring to one side or vertically so that the two halves do not center. This indicates that the after end of engine or reverse gear is also out, and must be moved until the couplings are exactly opposite each other so they match perfectly. Where there is quite a length of shaft inside the stuffing box, the weight of this should be taken into consideration and should be supported to prevent sagging.

Of course, the proper place to line up an engine and shaft is with the boat in the water, as even a strongly constructed boat will bend and sag when blocked up on shore more than most people would believe; so when this work is done on shore the alignment is more than likely to be incorrect after launching. Also, there is a tendency for the boat to become hogged more or less while in the water. For this reason it is a good plan to test out the alignment after a season or two; or at any time should there be trouble in keeping the couplings tight on their respective shafts, or with the stuffing box or other bearings that would be affected.

Of course, where the coupling faces are inaccurate, it is useless to try to align the engine in this way. A flange coupling should be either shrunk on, pressed on, or at least driven tightly on to the shaft. Then a key or feather

(*Continued on page 72*)

any of the sockets, while the key may be used in either of the other two. In this way the lamp may be located to best advantage to meet conditions and likewise the key. The lamp may be hung by its guard from a small hook on the mast or from the awning frame.

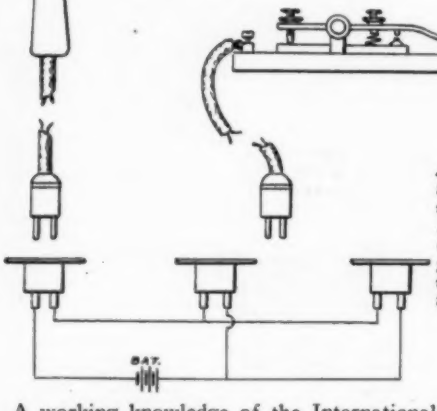
A certain degree of privacy may be secured if it is placed at a port hole.

The parts used are all standard and may be found in any motor boat accessory catalog with the exception of the telegraph key.

J. F. C., Providence, R. I.

Uses Standard Stern Light

FOR signaling or communicating between motor boats after dark, the blinker light is the only method readily adapted to use on small boats and those not equipped with wireless outfits.



A standard trouble lamp is used by T. F. C. for a double purpose, one as intended and the other as a signal lamp

A working knowledge of the International Morse Code is necessary for blinker signaling. This code comprises dots and dashes so arranged that they represent the letters of the alphabet, and messages are spelled out.

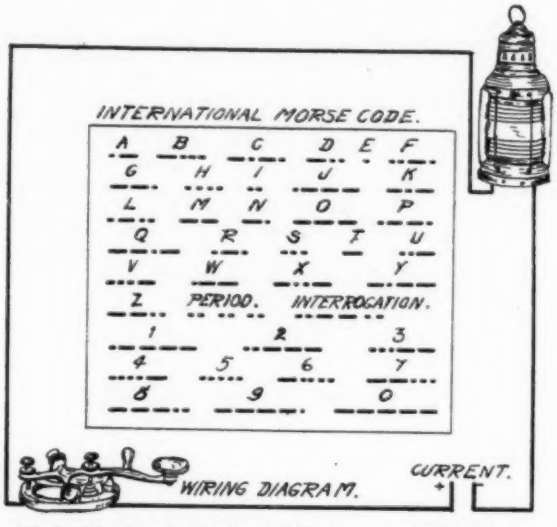
The lamp may be any standard range light sternlight, having a fluted or fresnel glass. On account of its exceptional visibility, the triplex lens light will be found most efficient. There is a combination stern light and flag pole on the market which may be hoisted to the mast-head in the same manner as the owner's private signal. For short distances on clear nights a plain glass lamp may be used, but on foggy or hazy nights its range of visibility will be very short.

If you do not purchase the lamp wired for electricity, a little care in placing the bulb exactly in the center of the lens diametrically and vertically will be well worth the trouble, for at this point the source of light will be in focus with all parts of the lens and greater visibility will result. A high power bulb is not desirable, as the filament will not glow as readily and will continue to glow slightly longer than the current continues. The writer has found that a class I lamp with a four-candlepower Mazda bulb gives satisfactory results.

A good substantially constructed telegraph key may be purchased for not more than a dollar. This key has special contact points which will not burn and miss contact, and the lever spring tension is adjustable to the operator's hand. There is also a switch integral with the key, which when closed, causes the light to burn continually.

The source of current may be dry cells or a storage battery and the bulb must be of a voltage suitable for use with the current. On boats electrically equipped it is a simple matter to plug into the lighting system.

The wiring and connections are very simple. The lamp key and battery are in series. Run a wire from the source of current to the lamps, to the key and back to the battery.



W. B. M. gives a simple wiring diagram and the international code

For wiring use waterproof lamp cord or stranded cable, proportioning the length to the height of the lamp and the distance from the key. The wiring could be permanently installed below deck with a waterproof outlet plug for connecting the lamp cable, and fitting a flexible cable to the key so that it can be carried to the most advantageous point.

Mastering the International Morse Code and blinker light is not difficult, and those unfamiliar with it are urged to devote a few of the long winter evenings to practice. Get other members of the club interested and you can all have a profitable good time together. A book on telegraphy and someone who understands the system will be a great help in learning. In sending blinker be careful not to slur over the dots and dashes as they then become unintelligible. In reading blinker messages, try to carry the last word. Do not write the preceding word until the last word is understood. In this way there will be less confusion than in trying to write down each letter or word as received and you can make better speed.

W. B. M., Newburgh, N. Y.

Correcting Faulty Shaft Alignment

Details of Excellent Methods of Detecting Faults in Shaft Lines and Numerous Suggestions for Remedying Same

Answers to the Following Questions Published in the October Issue

"Describe in detail the best method of testing and correcting a faulty alignment of propeller shaft, clutch and engine"

Correcting Faulty Alignment of Shaft

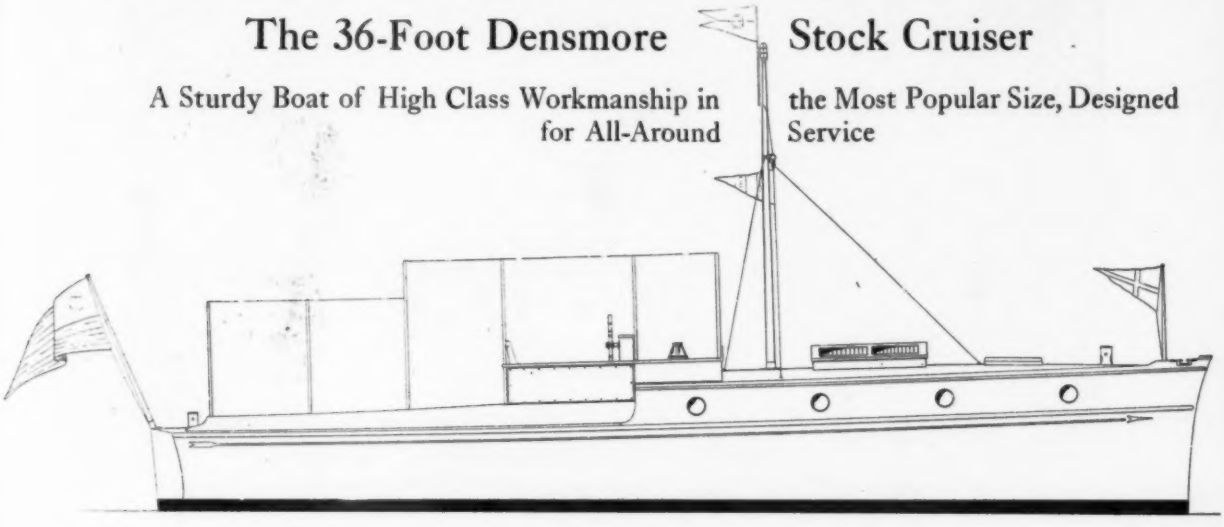
(The Prize-Winning Answer)

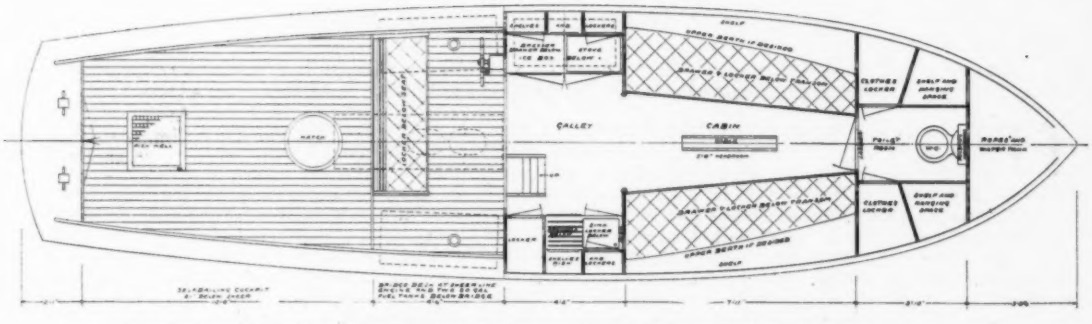
IF the shaft or engine is badly out of line, this will be indicated upon throwing open the compression cocks and turning over the engine and shaft by hand with the clutch in. A faulty alignment will cause the flywheel to turn hard. Under way, the bearings will run hot, an inside stuffing box will begin to leak and the engine R.P.M. may be reduced. Usually the shaft is connected to the clutch shaft by means of flanged couplings; also the clutch to the engine. By taking out the connecting bolts, any dis-alignment is quickly seen, as the coupling flanges will open to a greater or less degree on one side; with a perfectly

New Small Standardized Cruisers for 1922

The 36-Foot Densmore Stock Cruiser

A Sturdy Boat of High Class Workmanship in the Most Popular Size, Designed for All-Around Service





Outboard profile and arrangement plan of the new 36-foot Densmore stock cruiser

AMONG the largest of the new Standardized cruiser models which are to be developed for the coming season can be mentioned the 36-foot cruiser being built by the J. M. Densmore Company in their yard at Atlantic, Mass. The beam dimension of this boat is 9 feet 8 inches, while the draft has been held to 2 feet 8 inches. This boat is intended primarily to fill the need for an able all-around cruising craft, while for such purposes as fishing and trolling it will travel smoothly at low speed. While no particular engine is specified as standard equipment, provision is made to adapt any one of several high-grade motors to the boat, which will result in a variation in the maximum possible speed from a minimum of 10 to the highest of about 20 m.p.h.

The methods of construction used in this boat follow the high class usual in Densmore-built boats and is exceedingly sturdy, while the workmanship is of the highest grade. Structurally, the frame is made of white oak with planking of hard pine or cypress, the decking of the cockpit and bridge deck floor being of white pine laid in marine glue.

Spacious accommodations are afforded in this boat and consist of toilet room forward with clothes lockers, hanging space and ample shelves. The main cabin aft is provided with four berths and a folding table and then a complete galley equipment, including a refrigerator, alcohol stove, white enamel sink and abundance of pantry and galley gear space. The engine space is aft of this and is reached from the galley and through a hatch under the removable bridge seat. This compartment is sheathed and painted and contains the motor, fuel tanks, supply lockers, storage shelves, etc.

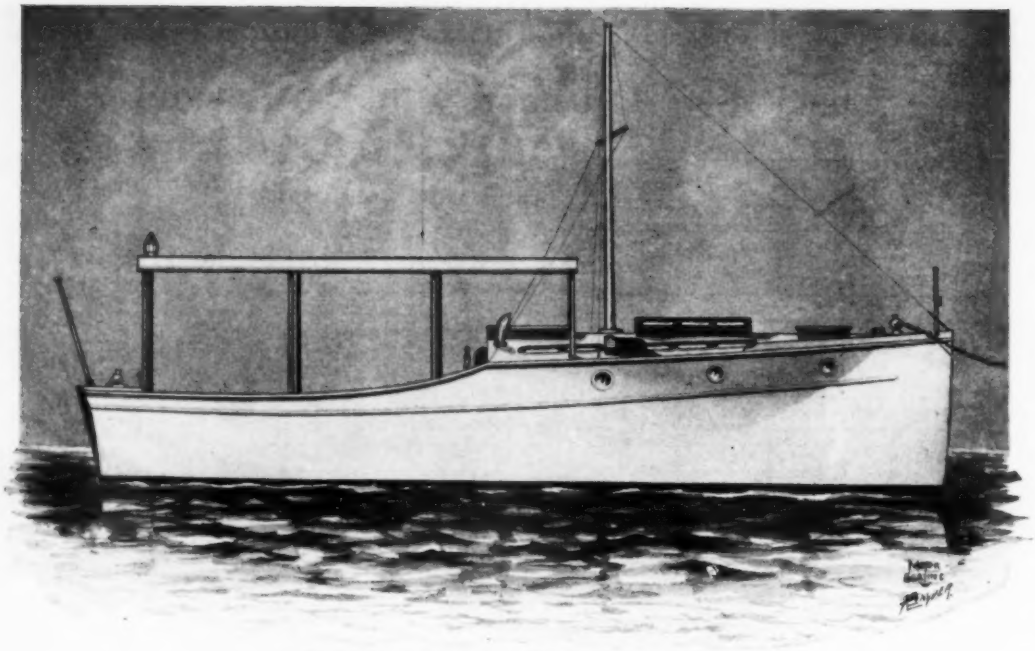
The control of the boat is centered on the bridge deck, where the steering wheel, binnacle and engine controls are located. An excellent feature is the combined wood and glass windshield at the forward end of the bridge and the awning over the entire cockpit space. The windshield protects the operator from all flying spray, rain and cold winds. For fair weather use the windows are raised and give free circulation of air. For the fisherman a fishwell is built into the cockpit space in which the catch may be kept alive and fresh until wanted.

The interior of the cabin is sheathed with t and g siding, which is painted and enameled. All trim and furniture is of mahogany and finished in spar varnish. The hanging closets forward are fitted with shelves for hats and hooks and rods from which to hang all manner of clothing. An additional locker in the galley is fitted for the reception of guns, fishing rods and such other sporting accessories as may be desired.

Throughout the boat all lights are fitted for use as either electric or oil combination lamps. This has the advantage that in the event of the storage battery running down light can still be secured by means of the oil auxiliary.

All fittings and deck hardware, both inside and outside of the boat, are of glass. Such underwater fittings as the propeller, shaft and bearings are of bronze. A Douglas Fir signal mast of suitable height is fitted, and the trim of the coamings, rails and interior of cockpit space are entirely of mahogany.

The engine selected is installed complete with electric starter and generator as well as ample storage battery capacity to take care of the entire load for lighting as well as for starting purposes. A copper tube of large size is run through the transom at the stern to carry off the exhaust gasses. The circulating water is admitted to this tube close to the engine to cool it.



Profile view of the new 28-foot Gray cruiser

The 28-Foot Standardized Gray Cruiser

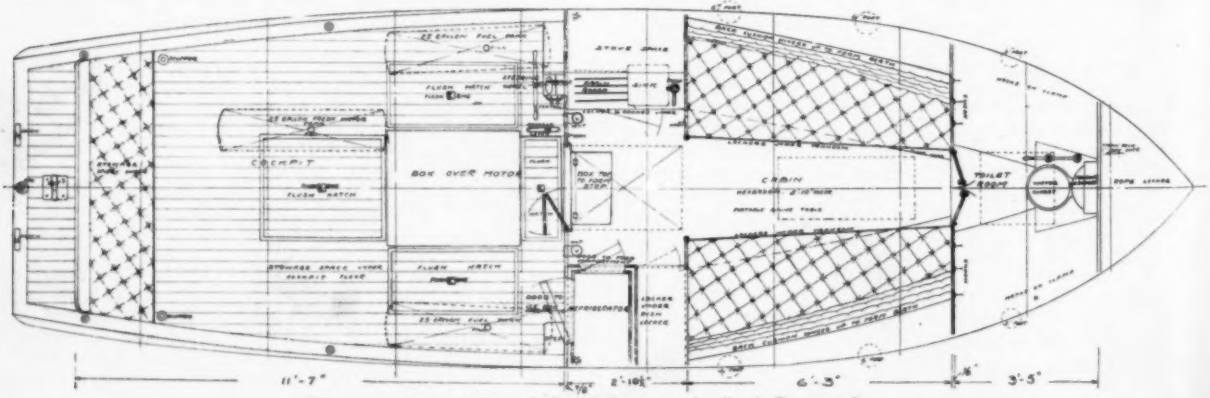
GRAY boats are being built in the little Maine seacoast town of Friendship. Generations of boat builders have built famous vessels, and it was here that the first boat launched in America was constructed. It is not surprising, then, for the latest and most complete of all standardized motor boats to hail from Maine.

At this time Gray boats are being built in but one size and type. This a 28-foot raised deck cruiser, finished in oak and galvanized fittings, or a De Luxe model in mahogany finish and brass fittings. These boats are identical in all details except the finish. The dimensions are 28-feet length over all, beam 8 feet 8 inches, and the design has been prepared by William J. Deed, who is familiar to MoToR BoatinG's readers.

The power plant selected for this boat is the Knox 20 and this selection is typical of the Gray policy of using the best the market affords for a boat of this size.

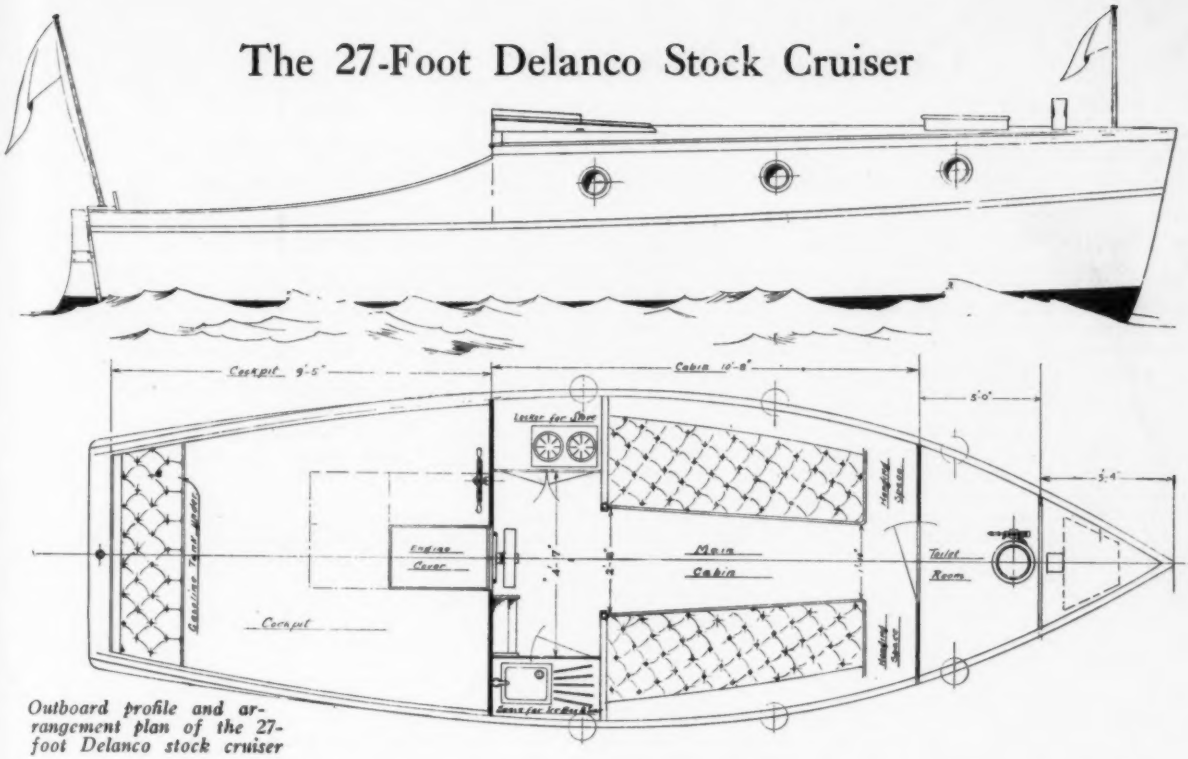
The raised deck type of hull was selected because of its superior seaworthy qualities, appearance, and because it affords the maximum amount of room below decks. In the bow there is storage space for anchor ropes and spare anchor; just aft this there is a roomy lavatory, with toilet and folding basin. After this is the main cabin, equipped with two upholstered seats with backs. At night the backs are swung into position to form two upper berths. An abundance of air and light is obtained by an extra large skylight. At the after-end of the cabin, on the port side, will be found the sink and stove, very compactly and conveniently arranged, below which is a large locker. On the starboard side is an exceptionally large ice-box, iced from the cockpit. On this side also is found another large locker, with dish racks above. At the after-end of the cabin is a water-tight bulkhead to eliminate odor and noise from the engine. Going still farther aft, through the companionway, we come to a delightfully large and roomy cockpit. Over the engine there is a box just seat height.

An outstanding feature of the Gray boats is the completeness of their equipment. When they are delivered they are ready to cruise without further expense, even the fuel, oil and ice being provided. The standard equipment of Gray boats includes, among other things, electric light, an awning with storm curtains, all plumbing and tank equipment, cushions, upholstery, flags, tools, and many others. In addition, articles which are generally purchased by the owner as he needs them to complete his boat are provided by this builder. Among these are a tender, boarding ladder, compass, full set of dishes, an aluminum set of kitchen utensils, silverware, linen, bedding, and a first-aid kit. Provisions for the initial cruise away from the builder's plant can also be placed on board if desired.



The arrangement plan of the 28-foot standardized Gray cruiser

The 27-Foot Delanco Stock Cruiser



Outboard profile and arrangement plan of the 27-foot Delanco stock cruiser

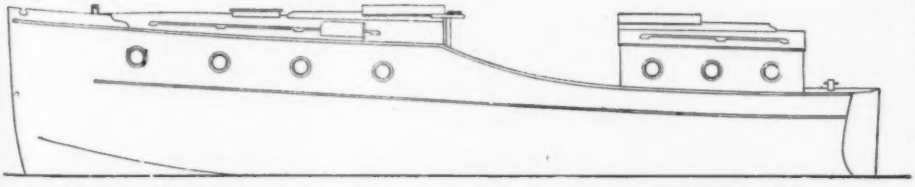
ANOTHER new small stock cruiser is announced to be constructed by the Delanco Boat Building Corporation at Delanco, New Jersey. This boat was particularly designed for this company by J. Murray Watts and is of the V-bottom type with seam batten construction. The hull members are all most substantial and the webb frames are of 1½-inch by 3-inch white oak. Battens of ¾ by 2-inch spruce back up each seam of the white cedar planking. The frames where necessary are steam bent to conform to the lines of the hull as laid out by the designer.

The arrangement is necessarily restricted to the conventional type which is possible in a hull of this size. The forward portion is given over to the toilet room, while the forward portion of the main cabin is equipped with hanging spaces for clothing, etc. Two berths on either side with upholstered cushions provide the sleeping accommodations necessary. A galley with a pantry closet below will be found on the port side just forward of the bulkhead, while the starboard side is supplied with sink and refrigerator, which is located on the inside of the boat well away from the heat of the engine and drains overboard. The cockpit is large and roomy and a seat is built in across the after end of the same.

The Delanco 27 will be equipped with a four-cylinder motor. A gasoline tank of ample capacity is built in under the stern seat of the cockpit. The location of the motor under the cockpit floor provides for easy accessibility since large amounts of unobstructed working space are provided on all sides of it. Ample storage space for the many items which accumulate on a boat is provided underneath the cockpit floor and in the lockers under the berths.

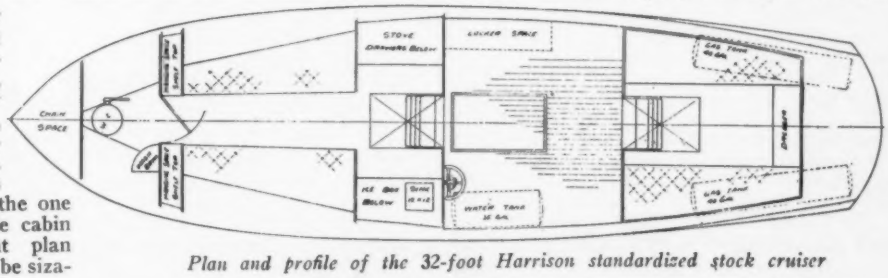
Among the unusual features to be found on this boat is the outboard rudder and the free access of water to the propeller. The dead wood above the keel has been shortened appreciably, with the result that the propeller is always operating in solid water. Standard equipment includes two-burner oil stove, cockpit and cabin cushions, awnings, flags, anchor, lines, lights, boat hook, and everything that makes a craft ready for her first cruise. This craft will drive easily and should prove to be quite fast.

The 32-Foot Harrison Double Cabin Cruiser



THE 32-foot cruiser which is being built by the R. W. Harrison Boat Works of Toledo, Ohio, has been completely standardized as to design, style and other characteristics to the minutest detail. Two stock models of this boat are now being built, the one illustrated being the double cabin model. The arrangement plan shows the forward cabin to be sizable and equipped with necessary accessories. Ice-box, stoves and galley equipment are about amidships.

The 40-h.p. Kermath motor has been selected as the power plant for this boat and a comfortable cruising speed of 12 m.p.h. is claimed.



Plan and profile of the 32-foot Harrison standardized stock cruiser

Cruising Down the Delaware

Continuation of the Cruise From Philadelphia to the Entrance of the Chesapeake & Delaware Canal, as Well as the Way to the Sea

CONTINUING on down the Delaware River from where Chart No. 25 leaves off takes us from Philadelphia further south. A few of the courses mentioned on Chart No. 25 can be repeated here. The ship channel runs down on the Pennsylvania side and along the wharves to off Greenwich point, where the Horseshoe ranges are picked up. Just below, on the Philadelphia side, are located three very convenient public landings, one at Pier 19 North wharves and one at Race Street, which are just above the principal ferry slips, and one at Dock Street Pier, in at the bulkhead. Of these the one at Race Street, the fireboat station, is perhaps the most convenient. From this landing it is possible to reach the best establishments that handle nautical goods of all descriptions, supplies of all kinds and water. Continuing down the river it is safe to keep along midstream until arriving off Greenwich. Here the east group of the Horseshoe Range is picked up. Standing down on this range for slightly over a mile until the Eagle Point Range closes. Then follow the Eagle Point Range to the intersection with the West Horseshoe Range. This course takes you around the curve and is about half a mile long. The West Horseshoe is then followed until the Ft. Mifflin Bar Range closes. This is a distance of about two miles and brings you off the Schuylkill River.

The Schuylkill River channel runs about midstream to Fairmount Dam, and is well marked with buoys all the way to the lock. It is possible to go up the Schuylkill by way of the river and canal as far as Valley Forge without any great difficulty. At the intersection of the Ft. Mifflin Bar Range with the course on the West Horseshoe group, you continue down past Hog Island with its fifty shipways. From this course, which is S W x W ½ W for a distance of about 3¼ miles, it is possible to make either Woodbury or Mantua Creeks. Woodbury Creek can be followed to the town of Woodbury by boats that draw less than four feet of water. At this end of the Ft. Mifflin Bar Range, abeam of black can buoy, you start the compass course W x S for a distance of a mile and a quarter. At night this position can be judged by the red sector on the rear of Tinicum Range Light. Here you take the Tinicum Range over the stern to a point where the Chester Range closes. The Chester Range and the Marcus Hook Range are auxiliary ranges to Schooner Ledge Range and should always be used by smaller boats, especially when the navigator is not absolutely familiar with the Delaware.

This course down the Tinicum Range takes you past Tinicum Island, back of which are the mouth of Darby Creek, the yacht clubs, boat shops, railways and the yacht anchorage. The entrance is found at the red and black buoy off Monds Island and in line with the front Chester Range mark located in the water.

Pass either side of the red and black buoy, keeping well off the end of Tinicum Island if passing to the starboard side of this mark.

The Chester Range to the intersection of the Marcus Hook Range, 2⅞ miles, takes you past the city of Chester. The end of the range is marked by two gas buoys, a red, and a red and black. Just below these buoys, on the Jersey side, is Raccoon Creek, which has a range and buoys marking its entrance, and can be followed to the town of Swedesboro by boats that do not draw over four feet of water.

The Marcus Hook Range to the intersection of Bellevue Range is a course W S W for 5 miles. On this range you pass the Pennsylvania-Delaware State Line on the starboard side.

The end of the Marcus Hook Range is marked by a gas buoy, and as the Bellevue Range closes the course is altered to S W ¼ S for 3½ miles to a point off Edgemoor west of Cherry Island Flats. There are red and black buoys at both ends of these flats, and to go to Pennsgrove it is safe to keep to the channel on the Jersey shore, passing between the upper red and black buoy above the flats and a red buoy off Oldmans Point Dike.

Or coming up the river between the lower red and black buoy and a red buoy off South Pennsgrove, it is quite possible to go aground either on the flats or the Jersey shore if due precautions are not taken going in here.

After leaving the Bellevue Range the next course is S S W ¾ W on the Cherry Island Range. On this course the mouth of the Christiana River is reached. There are two jetties extending into the river at this place for quite some distance. The north jetty has a light and bell tower on the outer end and a lighthouse on the shore end. This small river can be followed up to the city of Wilmington.

The Cherry Island Range extends for a distance of 5 miles, where the Deep Water Point Range is picked up. This point is marked by a gas buoy and is just above the city of New Castle.

The Deep Water Point Range course, S W ½ W for 4¼ miles, is followed to a point where Jetty Light is abeam and bearing E. This brings you to the curve in the channel which is made between a gas buoy and a black nun. At night this turn is covered by the red sector of Finns Point rear range light.

If the objective is the Chesapeake and Delaware Canal entrance at Delaware City, a course S W x W ¾ W is followed from the intersection of the Cherry Island and Deep Water Point Ranges to a point about where the New Castle Range would be visible on the starboard beam. Buoys are conveniently located about a mile apart which lead directly to the canal entrance. From the point where a red buoy is abreast of the end of Pea Patch Island the red sector of the Delaware City light is just touched until off the light. Stand in from there to the canal entrance which connects with Chesapeake Bay and Chart No. 9.

Continuing on our main course to the south, we resume the New Castle Range on a course S x E ⅝ E past Pea Patch Island and Pea Patch Shoal to a light and bell buoy just north of Elsingborough Point.

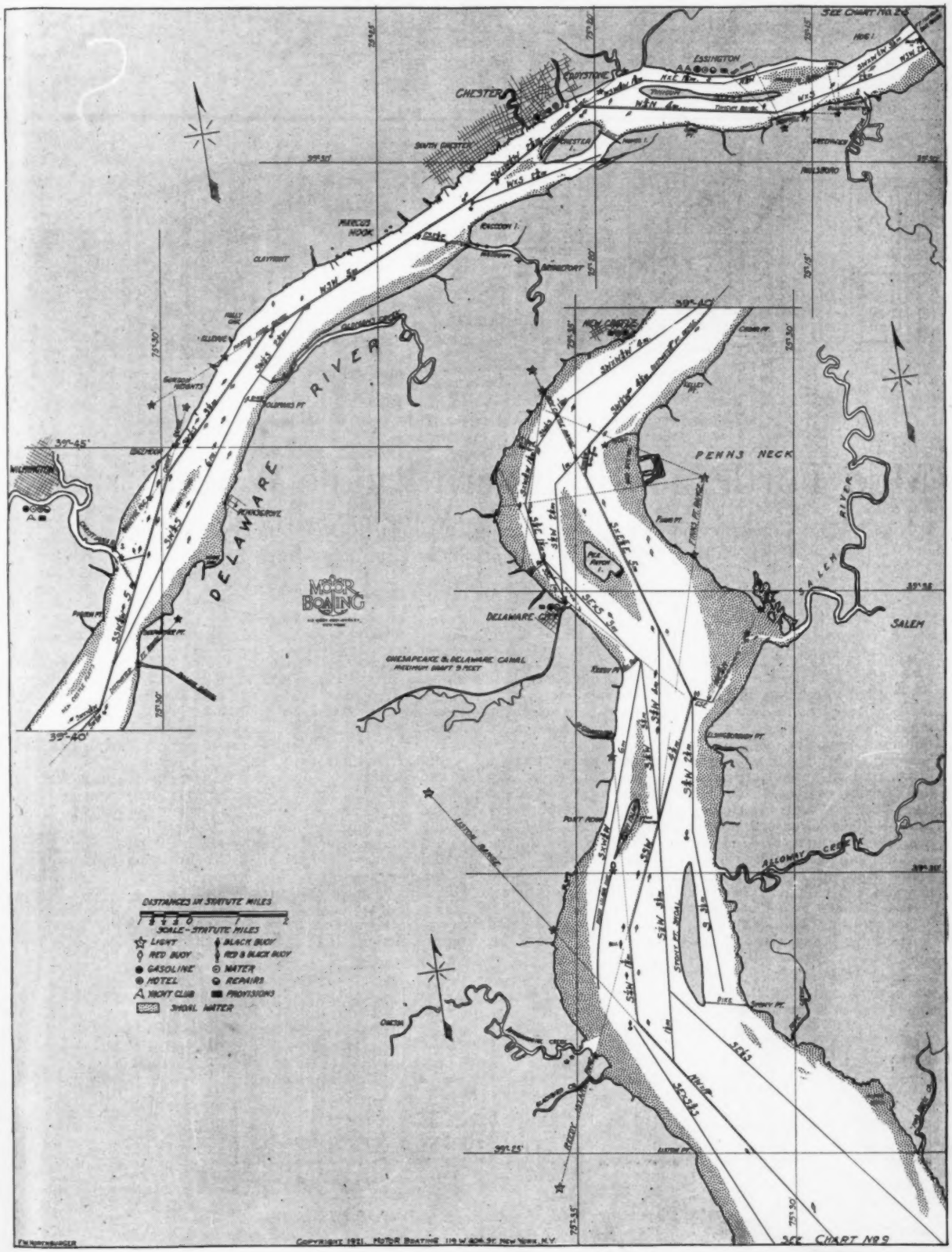
A course of S S W for 4⅞ miles to Reedy Island Dike and S ¼ W for 1⅞ miles to the Liston Range brings you to the course of S E x E for Ship John Light.

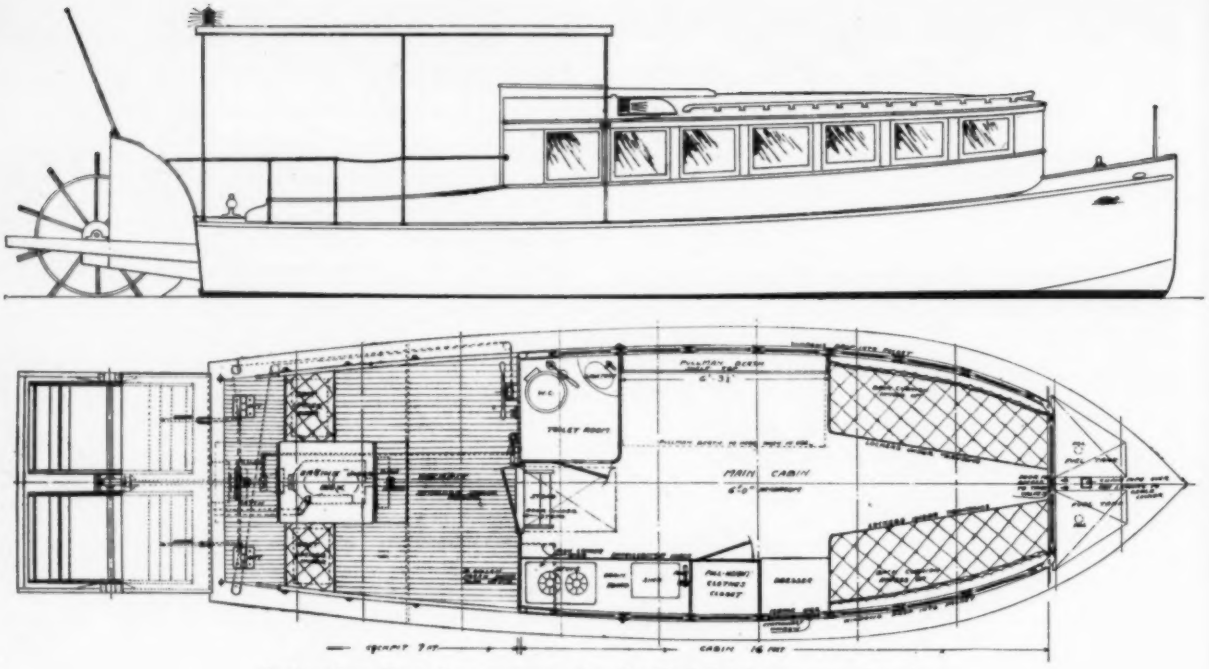
MOTOR BOATING'S NEW CHART SERIES

The third series of MoToR BoatinG's popular charts began with No. 25, which covers the Delaware River from Trenton to Philadelphia. Others in this series which follow will complete the route to the sea via the Delaware River as well as cover many interesting stretches of cruising waters on the way south and along the coast. It is planned to issue these about as listed below:

No. 25	**Nov., 1921**	**Delaware River, Trenton to Philadelphia.**
No. 26	**Dec., 1921**	**Delaware River, Philadelphia to Smyrna.**
No. 27	**Jan., 1922**	**New Jersey Coast, Cape May to Little Egg Inlet.**
No. 28	**Feb., 1922**	**New Jersey Coast, Little Egg to Barnegat Inlet.**
No. 29	**Mar., 1922**	**New Jersey Coast, Barnegat Inlet to Sandy Hook.**
No. 30	**April, 1922**	**Chesapeake Bay, Smith Point to Cape Charles.**
No. 31	**May, 1922**	**Potomac River to Lower Cedar Point.**
No. 32	**June, 1922**	**York and James Rivers.**
No. 33	**July, 1922**	**Delaware Coast, Cape Henlopen to Chincoteague Inlet.**
No. 34	**Aug., 1922**	**Virginia Coast, Chincoteague to Cape Charles.**
No. 35	**Sept., 1922**	**North Carolina Coast, Cape Henry to Beaufort.**
No. 36	**Oct., 1922**	**Carolina Coast, Beaufort to Charleston.**

Motor Boatmen's Chart No. 26 Delaware River
Philadelphia to Smyrna
For Use in Connection With Coast and Geodetic Survey Charts Nos. 294, 295





Outboard profile and arrangement plan for Mud Turtle, an unusual cruiser

Mud Turtle, a Novel Stern Paddle Wheel Cruiser

Construction Details for Building an Unusual Type Shallow Draft Craft Which Will Prove Exceptionally Useful in Many Localities

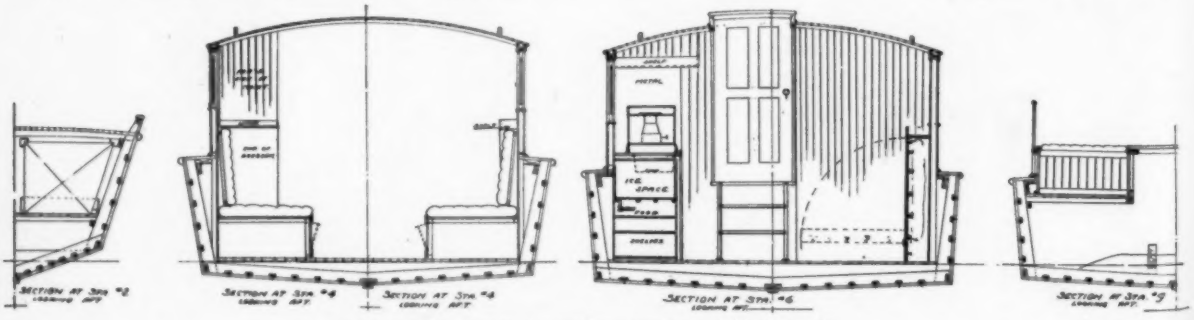
Designed Exclusively for MoToR BoatinG

By Wm. J. Deed

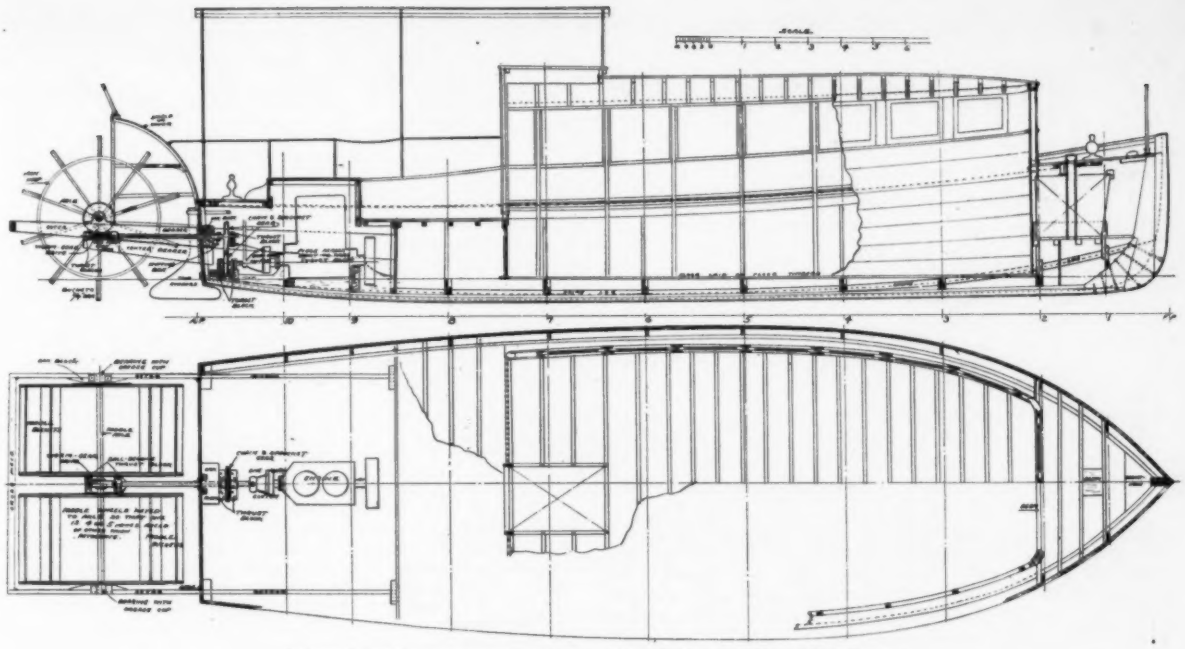
ALLIGATOR, in the November issue of MoToR BoatinG, met the requirements of many; but there are spots where the water is still very much more shallow than waters on which Alligator can be used and these waters are full of weeds and grass which wind about the screw propeller of the ordinary boat and put it out of business. So all you folks who run boats in such waters or need a boat to navigate on the heavy dews of many very fine cruising sections of the South, the rivers and bays and lakes of the West and in other parts of the world where MoToR BoatinG readers are found, gather round and look over these designs of Mud Turtle. A funny name, you say, but suitable for such a boat which will crawl along, giving constant kicks with its paddles. When you build her you can call her Theodora if you like fancy names better. What's in a name, anyway?

Not any too many designs of craft of the type of Mud Turtle have been published, yet there is a big demand for shoal-draft boats which prompted us to let you forgo the pleasure of getting a nice auxiliary yawl or day cruiser design. It is possible that you may not lose out on seeing these designs yet, but hundreds need just such a boat as we show this month and their cry had to be heard.

You may not think she is much more beautiful than her namesake, but she sure has all the ear-marks of a comfortable cruiser. How many of you have a boat with a cabin 16 feet long and 8 feet wide? How many have 30-foot cruisers with full 6 feet headroom with a cabin having five separate berths with plenty of floor room to dance around after the berths are made up if you wish? And how many swelter in a two by twice cabin with a 5-inch port hole or two because you must have privacy and you must have a boat that you can go to sea in some day—which, by the way, never comes, but you do use the boat every week-end on quiet waters where it wouldn't make a bit of difference if the whole side of the cabin was knocked



Construction details for various stations of Mud Turtle



Inboard profile construction plan and details for building Mud Turtle

out? If the cabin plan shown here were incorporated in hulls of deeper draft, many a man who doesn't need a real shoal-draft boat would grab it quick. And don't be surprised if the writer does just this very thing soon. If one wants privacy in this cabin it can be curtained off, and without making a stuffy compartment like a Pullman car section out of it, either. And you don't have to get out of bed so that the cook can get at the stove or the dish locker in order to get breakfast; you can have breakfast in bed on this craft if you can get anyone to cook it and bring it to you.

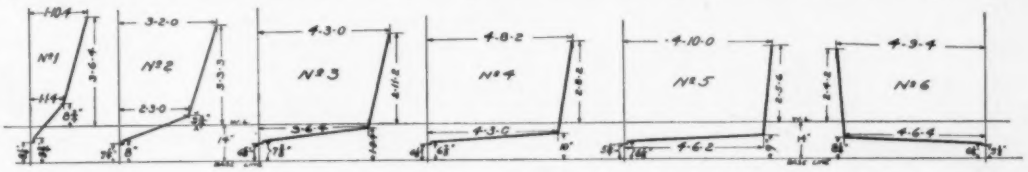
The deck space is not as large as many craft of her length boast of, but you can't eat your cake and have it, too. Yet a cockpit 7 feet long, to which are added the short aft and forward decks, is sufficient for the average party; if you take out a Sunday School picnic, tow them in a boat astern. The average cruiser of this size North or South, East or West, is owned by an average man and the average man these days doesn't entertain the whole town or lodge or personnel of the office—not unless he's running for office—so average conditions have to be considered in keeping down the size of this boat by giving a good cabin and good deck room for average use. That stern wheel with the cover or shield is not beautiful, but those paddles entering the water gradually and at such an angle that they push down the grass and weeds, exert a thrust on the water that these weeds cannot stop; in cases where the grass is very long and troublesome, the wheel can be equipped with a device for cutting the grass. Beauty gives way to utility; yet Mud Turtle might be far worse looking.

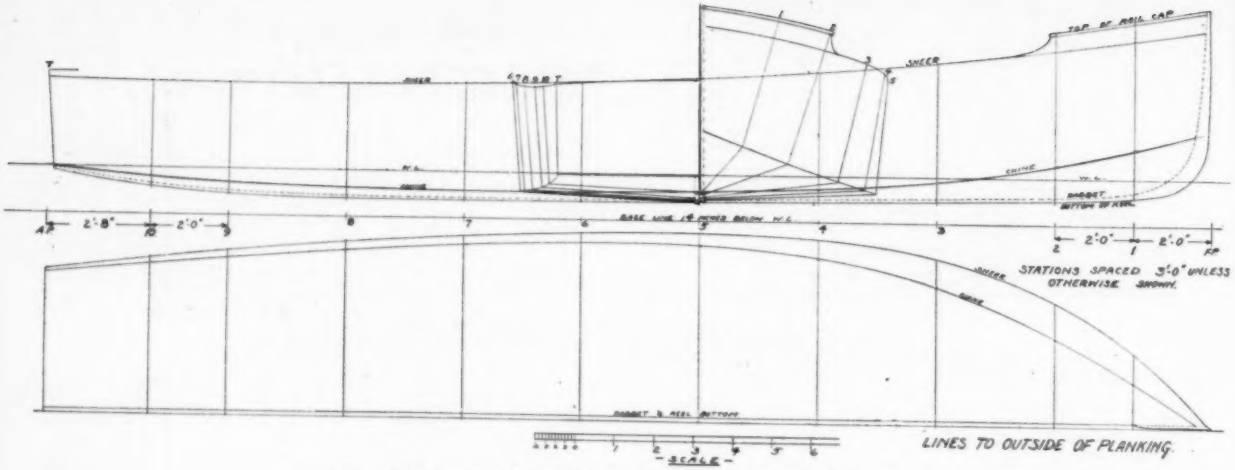
The large amount of floor area is valuable in the cabin; in boats with narrower bottom, floor area is of course reduced, but with this wide model given our boat we get room for a table with comfortable camp chairs around it (by comfortable we mean those canvas-bottom camp chairs with arms and back) and all the comforts of a shore camp or bungalow can be had, with room to walk around the cabin as well. This cabin will not be stuffy. With all the windows dropped down into pockets, the cabin is transformed into practically a cockpit with standing roof, and there is nothing to interfere with a clear passage of air back and forth. We believe that some such cabin as this is needed by scores of boatmen; couple this cabin with very shoal-draft and several scores more are satisfied. Our accommodations are equal to those found in many a larger boat.

Construction of Mud Turtle, you can leave out the word mud if you wish, but this being written around election time, the word mud quite naturally entered in because of the large amount being thrown about, is simple and follows, except for the tunnel and the omission of shaft log, etc., that of Alligator. She is nothing but a box so far as the hull is concerned and the joinerwork can easily be mastered by studying the plans and reading the MoToR BoatinG Handbooks, as well as going to some boat yard and watching construction going on.

In view of the fact that it is impossible, with all the various makes and sizes and shapes of engines there are, to outline a definite dimensioned machinery installation, you will find that the plans call for an average installation so far as space goes. Details will have to be worked out to suit the particular engine you install. You may have some engine on hand that will fit. Of course, the slower the revolutions of the engine are, the less the reduction in speed from engine to paddle wheel required. One man may install an engine turning at 600 r.p.m. and another install one turning 1,000 r.p.m., so the diameters of the sprockets are not to be measured from the drawings. The manufacturer of the engine actually installed will be glad, in the interests of his engine, to work out an installation that will prove right. The paddle wheel should turn about 25 r.p.m. per minute. This will give the boat a good speed of about 8 miles an hour for cruising. The general scheme of the paddle wheel drive is given in the specifications and should be followed. In large boats used in very shoal waters having this type of wheel in order to avoid danger of the driving gear being broken in case the boat suddenly hits a shoal, thereby throwing added load onto the driving gear and wheel, there is introduced in the chain drive a sprocket wheel having two cone-surfaces, one of which

Sections for preparing molds at each of the forward sections





Complete drawing in profile and plan for laying out the lines

engages a hub keyed to the shaft and the other engaging a sliding cone which is held to its work by bolts and springs. The bolts are adjusted so that they will just transmit the full power of the engine but will slip with any increase in load. The gears should be well supplied with grease, a cover not shown on plans being provided to hold same so that the gearing is running in grease all the time.

The construction of the wheel and the supporting beams and bearers should be most solid and well fastened. The bearers should be well fitted to support the weight.

In closing this series of common sense designs of sensible boats for 1921 the writer and designer desires to thank the readers of MoToR BoatinG for the very hearty reception which has been given these designs. It has proved to all that the series was just what is needed. There are so many who can afford to build a good small boat costing but a few hundred or a couple of thousand dollars at most who need complete designs to work from so as to insure a good result and investment, but there are a fewer who go in for larger boats and they get designs to order anyway. So MoToR BoatinG has proved of service to many through this series of designs and many of these boats are being built by owners and by professional builders all over the country. We would like to learn of every one of them, to hear all about them, the engine being used, the finish, the cost, the speed, and everything. Also if you can send photographs it would be appreciated.

If you have problems let us know, addressing your letter care of W. J. Deed. We hope that you will enjoy your boat and will be glad that MoToR BoatinG helped to bring that pleasure to you.

Arrangements have been made whereby those desiring full scale blue-prints of the drawings for any of the designs in this series can secure them at nominal cost by addressing F. W. Horenburger, 63 West 184th Street, New York, N. Y.

Specifications

In General: In carrying out these specifications only the best lumber shall be employed. All lumber shall be air-dried, free and clear of all loose knots, checks, dry rot, sap, etc., that would render it unfit for use, and all fastenings, unless otherwise specified, to be hot-dipped galvanized stock. Boat to be built under cover.

Dimensions of the completed boat to be: Length over all, 29 ft. 8 in.; breadth over planking, 9 ft. 6 in.; draft, 9 in.

Hull

Keel: White oak or yellow pine sided 3 inches, molded as per plan.

Keel Batten: White oak or yellow pine sided 5 inches, molded 1⅛ inches secured on top of keel by floor timber fastenings and nailed to keel between floor timbers by nails with heads countersunk and covered with pitch or bituminous cement to prevent bilge water reaching them.

Stem: White oak or yellow pine sided 3 inches, molded as per plan, reinforced by 3-inch oak or yellow pine apron bolted through stem every 9 inches above knee bolts by ⅜-inch diameter galvanized rivets, heads countersunk in face of stem and plugged. Apron to be reinforced by 3-inch oak knee secured to keel and apron as indicated by ⅜-inch galvanized bolts as above. Stem band to be ½-inch brass half-round secured with brass screws, stem band to extend down to meet brass rubbing piece on keel bottom.

Rubbing Piece on Bottom of Keel: To be ⅜ by 3-inch brass flat secured by countersunk head brass screws to bottom of keel. If boat is used in Northern waters the stem band and rubbing piece may be galvanized iron flat.

Frames: To be located on stations. To be ⅞-inch thick molded as follows: bottom frames 3 inches throughout, side frames 2½ inches at top and 4 inches at bottom; both to be riveted together at chine by five galvanized wire nails riveted. To be notched for seam battens. Limber holes to be bored for draining water in bilge.

Floor Timbers: To be 1⅛-inch finished thickness, molded as per plan, riveted to frames and fastened to keel by two galvanized bolts. In way of engine floor timbers to be larger.

Sheer Clamp: To be yellow pine, spruce, fir, or such wood, each clamp in one piece. To be riveted to each frame by galvanized rod, ¼-inch diameter. .

Shelf: To be located over clamp, to be 1¼ by 4 inches fastened to clamp and to frame.

Transom: To be 1-inch white cedar, cypress, or pine or oak, seams caulked, payed with lead paint, filled flush with seam composition. Around edges oak piece 1 by 2 inches to be fitted to take the ends of planking; transom to cover ends of planking.

Planking: To be white cedar, pine, cypress, or fir in strakes of single length. At seams 1 by 2¼ inches yellow pine battens to be fitted into notches in frames, fastened with long wood screw. Seams to be centered on battens and all plank edges to be fastened with 1¼-inch No. 9 brass screws spaced 4 inches, seams caulked with yacht cotton, payed with lead paint and filled flush with seam composition. All fastenings countersunk and heads covered with wood plug dipped in shellac or white lead.

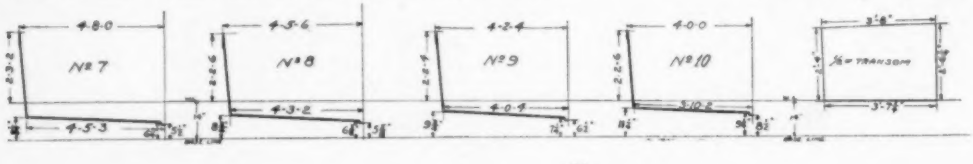
Chine Log: To be oak or yellow pine 1⅜ by 2½ inches, fastened to frames. Lower edge beveled to suit.

Deck Beams: Forward and aft deck beams to be oak 1⅛ by 2 inches crowned and spaced as per plan. At forward end of house beam to be 2 by 2 inches.

Cabin Floor: To be ¾-inch pine laid on floor timbers and nailed to same. For a width of 18 inches at center boards to be left loose.

Deck: To be ⅞-inch white pine painted. Covering board to be 7 inches wide. Flush hatch aft to be same construction as deck. To be fitted with flush ring for lifting.

(*Continued on page* 134)



Sections for preparing molds at each of the after sections

How Much Should a Motor Boat Cost?

The Various Reasons Why Some Craft Cost More Than Others—The Twelve Designs by Deed Published in MoToR BoatinG This Year as Concrete Examples

The outboard profiles and interior arrangement plans of the boats illustrated in this article are those designed by Mr. Deed which have been published in MoToR BoatinG during 1921. It is suggested that the reader refer to the particular issues for more detailed information.

The twelve complete designs by William J. Deed are now being published in book form by MoToR BoatinG. Each boat is described and illustrated in full with specifications.

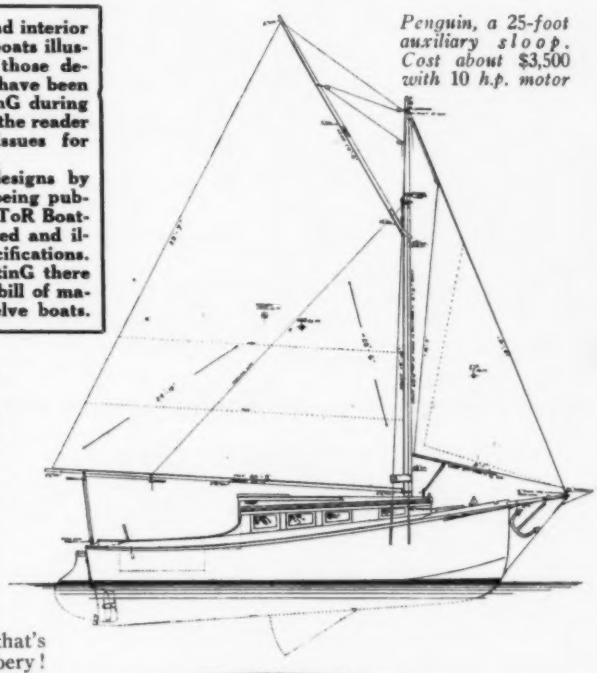
In January MoToR BoatinG there will be printed a complete bill of material for each of the twelve boats.

THE cost of motor boats is an elusive quantity which necessarily attaches itself to every boat and which every owner knows by the pull on his purse-strings is there, but just why John Smith's boat that is just like Jim Jones' boat costs nearly twice as much is not thoroughly understood. As a rule, Smith is more apt to understand the value he has in his boat than Jones is, but many Smiths do not. When they go to a designer or builder and find just what they want the first question they put is "What's the cost?"

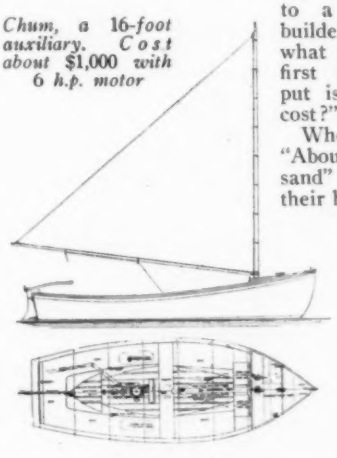
When they hear "About eight thousand" they throw up their hands and protest, "Why, that's highway robbery! Jones, there, got a boat just like this built by —— (and he's a fine builder, you know) for six thousand. Can't hold me up for eight." And Jones probably goes aboard Smith's $8,000 boat and, after looking around, remarks with a sad smile, "Say, they saw you coming when you gave them eight thousand for this hooker. You got stuck just about two thousand. My boat's just as good and I got her for six."

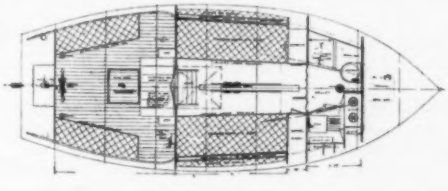
That just as good and just the same phrase has been overworked; let's give it a rest. It has been responsible for getting inferior articles in place of what you ask for, because the store-keeper says, "It's just as good as ——." It is not. In boats, engines, equipment, etc., there are quality products which the manufacturer has given a trade name in order that that quality which he has built into the product should be protected. When the hardware man tells you that electric-galvanized nails are just as good as hot-

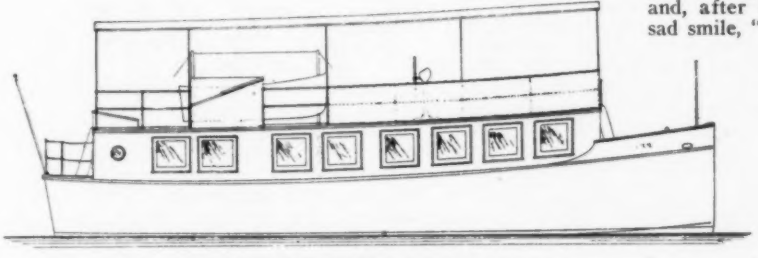
Penguin, a 25-foot auxiliary sloop. Cost about $3,500 with 10 h.p. motor

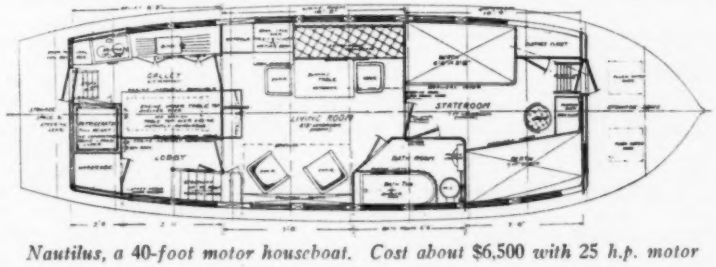


Chum, a 16-foot auxiliary. Cost about $1,000 with 6 h.p. motor



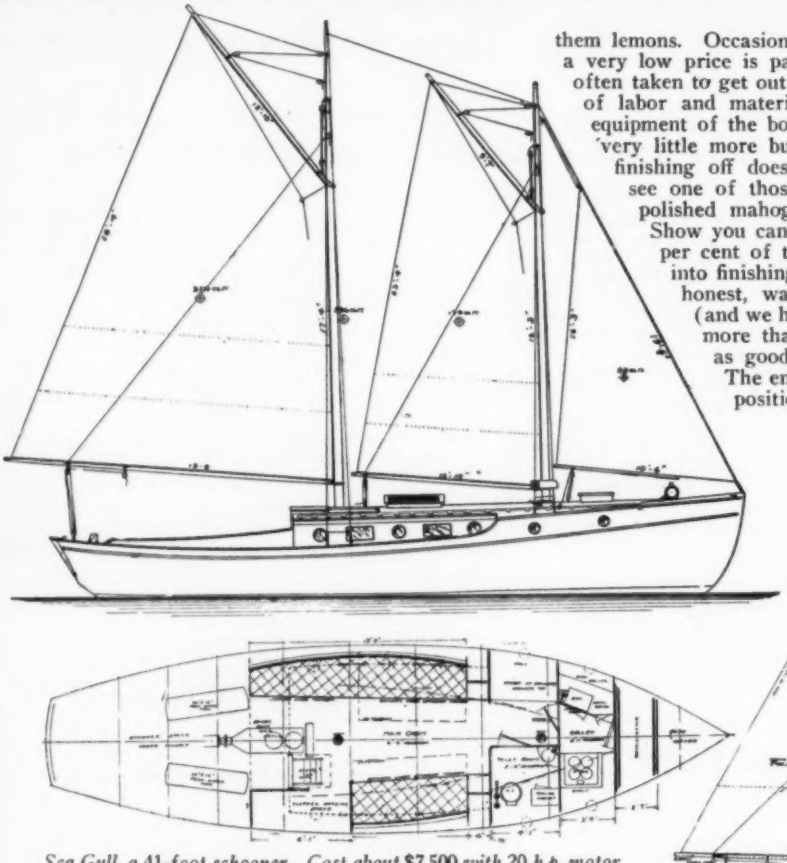






Nautilus, a 40-foot motor houseboat. Cost about $6,500 with 25 h.p. motor

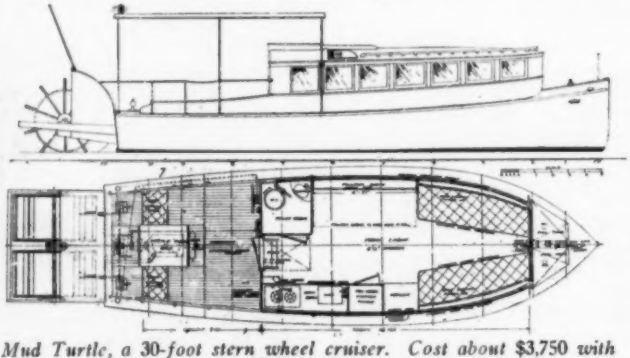
them lemons. Occasionally one slips through. When a very low price is paid for a new boat, the means often taken to get out whole is to reduce the amount of labor and material put into the finishing and equipment of the boat. The main hull itself costs very little more built good as built fair, but the finishing off does run into money. When you see one of those wonderfully beautiful fancy polished mahogany hulls in the Motor Boat Show you can just put it down that fully 50 per cent of the cost of that boat has gone into finishing. The average boat builder is honest, wants to give dollar for dollar (and we have met those who tried to give more than a dollar) and turn out just as good a craft as the price covered. The engine builder is of the same disposition, and so all along the line.



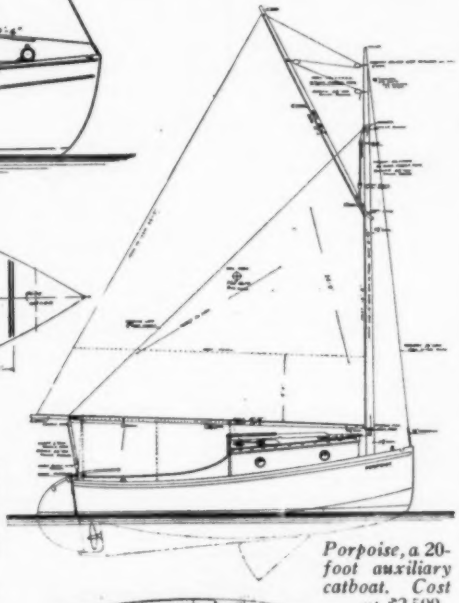
Sea Gull, a 41-foot schooner. Cost about $7,500 with 20 h.p. motor

dipped galvanized nails, because he doesn't have the latter kind, don't take 'em. When the boat builder has a stock of a certain inferior quality of lumber of a certain kind and wants to tell you it is just the same as what is specified, don't fall for it. These phrases are easy to say in a hurry, but it takes a long and sad experience sometimes to find out the truth.

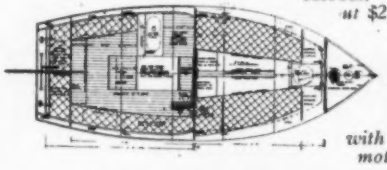
Actual use brings out the imperfections, the flaws, the poor quality of material and workmanship that make one boat a poor investment, short-lived, even unsafe, while another boat costing about the same is full-value, enduring, safe and a source of satisfaction. Did you ever run across a boat where the owner was always throwing good money after bad, fixing this and that, a boat that never was and never will be tight, for instance; she's a lemon, you say, because with hollow seams in her planking she'll never be caulked tight. Very, very few builders have turned out craft with glaring defects that made



Mud Turtle, a 30-foot stern wheel cruiser. Cost about $3,750 with 15 h.p. motor



Porpoise, a 20-foot auxiliary catboat. Cost at $2,500

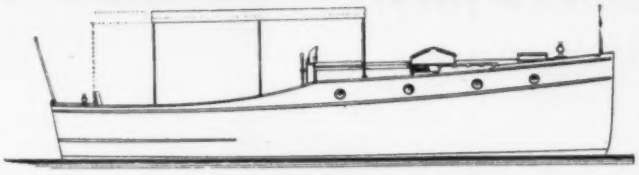


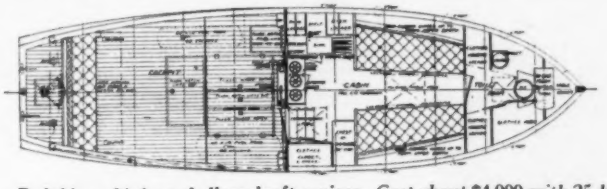
with 8 h.p. motor

Some have an idea that people in the trades supplying motor boats and yachts and all that goes into them work under different laws of business from regular business. But not so. Economics rules just the same.

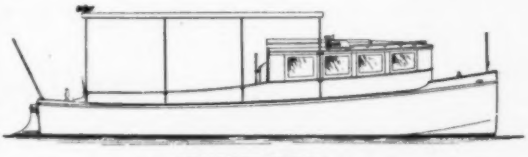
Cheapness lowers values. Mind you, we do not say low price, but cheapness, which means poor materials, poor workmanship, something worth less than was paid for it. Perhaps you think this somewhat off the subject of motor boat costs, but is it? Cost is a subject with many queer sides to it when applied to motor boats and all that goes to make up the cost of motor boats. Reputation enters into it. "Oh! Yes," you say, "a Blank engine; why that's about the best made. No, I wouldn't worry about that motor one minute. I'll take it." You

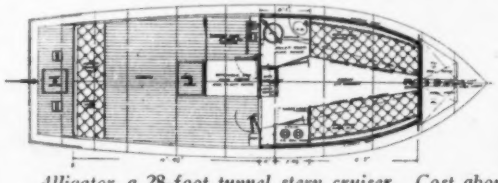
are speaking of one of the best known makes that is before the public eye and the great reputation sells you. But one of those same engines has perhaps (as is true in the case of one big engine of the same make which we happen to know of) spoiled the boating of more than one owner, because of troubles which the factory man seems absolutely unable to remedy. Then again there is the little one-lung kicker, nothing but a cylinder, piston, spark plug, carbureter, connecting rod and crank shaft, that runs all covered with rust every minute, never failing, and the owner simply gives her gas and oil and only knows how to start and stop her and doesn't know what a repair man looks like. Yet that engine cost $100, while the big high-power engine with the big name cost $5,000. So what's the answer? Simply that the expensive engine which has never worked right has some inherent fault that slipped by everybody, even the testing stand, for machinery is produced by human beings and we are all capable of mistakes, while the little low-priced engine that never gives any trouble is the usual product of its manufacturer. For it is very seldom we find that any firm in any line can continue to turn out poor, unreliable products and stay in business. While quality and price curves would run about parallel, one increasing with the other, as a general rule, yet this is not always true. The highest priced is not necessarily the best. The price tag is not everything. It's what is back of the price that counts. Often we see instances which seem to indicate that the high-priced article is not as good as one of the same kind and type and that will do the same work, but which costs only say 75 per cent as much. The high-priced article may prove to be a lemon as often as the low-priced one.



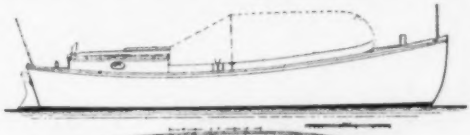


Dolphin, a 34-foot shallow draft cruiser. Cost about $4,000 with 25 h.p. motor





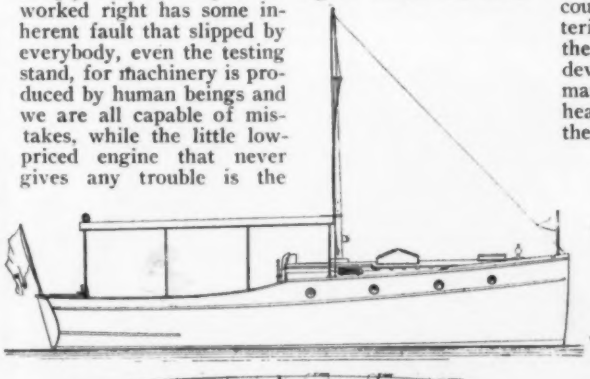
Alligator, a 28-foot tunnel stern cruiser. Cost about with 20 h.p. motor

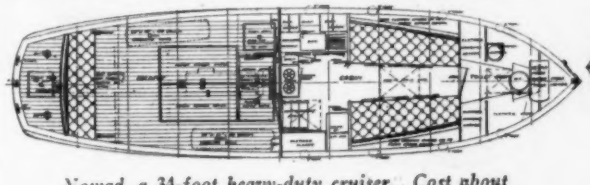


Shrimp, a 25-foot Hampton boat. Cost about $2,500 with 20 h.p. motor

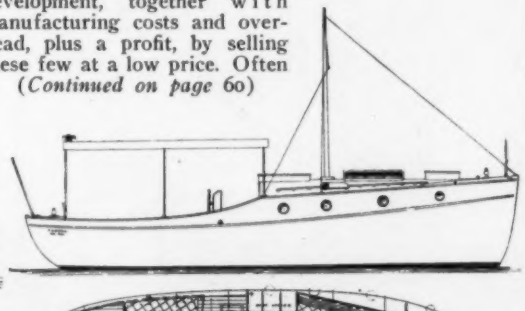
But one thing is certain; an engine, for instance, which is priced very low in relation to other engines of the same type and power and which will do the same work equally well must owe its low price either to quantity production or to special low costs of production. For it is inconceivable that any concern could build only a few engines, using the best materials and workmanship, testing, etc., and get back the costs of experimenting and development, together with manufacturing costs and overhead, plus a profit, by selling these few at a low price. Often

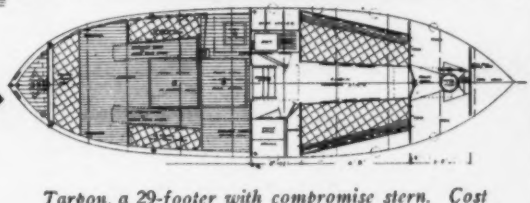
(*Continued on page 60*)





Nomad, a 34-foot heavy-duty cruiser. Cost about $4,000 with 24 h.p. motor

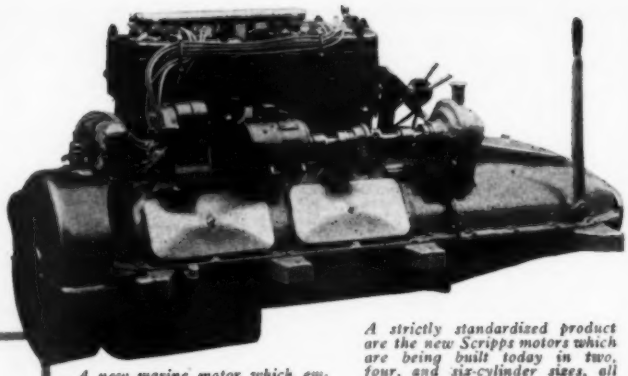




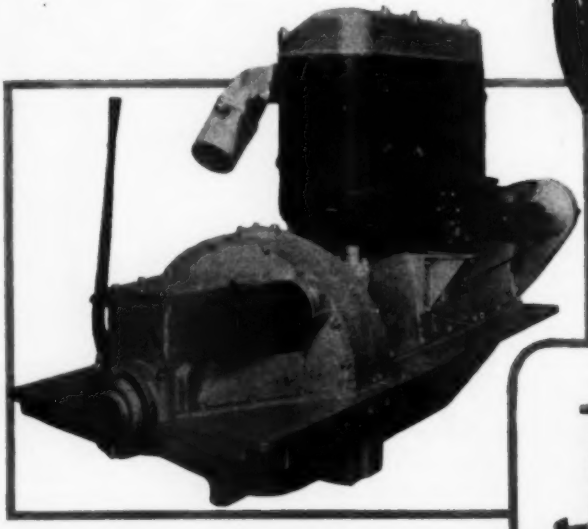
Tarpon, a 29-footer with compromise stern. Cost about $3,750 with 18 h.p. motor

Newest Motors for the 1922 Season

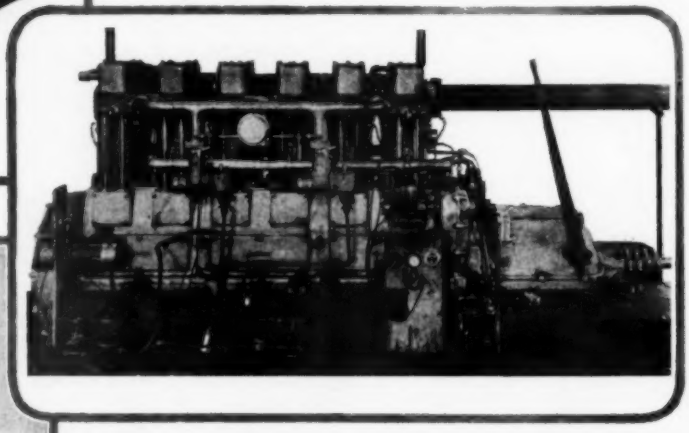
An Illustrated Synopsis of the Newest Developments in the Marine Motor Industry



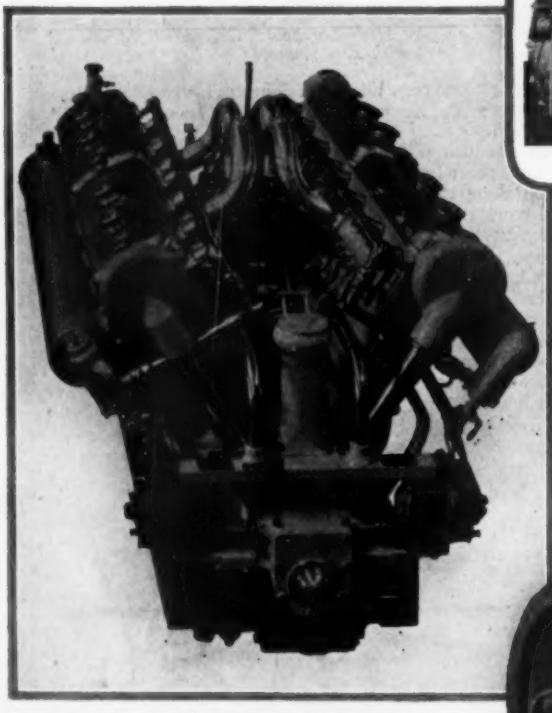
A strictly standardized product are the new Scripps motors which are being built today in two, four, and six-cylinder sizes, all with the same bore and stroke, that is, 4¼ inches by 6 inches. The horse-power range of this motor is remarkably great since at 600 r. p. m. the motor develops just under 25 h. p., while at 1800 r. p. m. the horse-power developed is 69.3. This motor accelerates rapidly and runs with little or no vibration



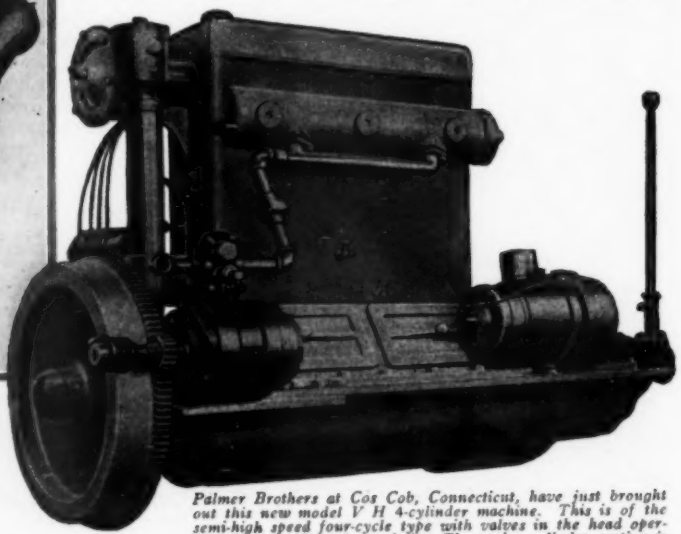
A new marine motor which embodies all of the most recent developments in gas engineering is the Stearns, made in Ludington, Mich., by the Stearns Motor Manufacturing Co. This motor is being made in several sizes and will develop exceptionally large horse-power ratings on its bore and stroke. For its size it is unique on account of the enormous surface of its bearings, these being at least twice as large as most motors of the same cylinder capacity and power rating



The new model six-cylinder Speedway gasoline motor is a most compact unit. It will develop 300 h. p. at 1300 r. p. m. on a bore and stroke of 6¾ by 8 inches. The weight has been kept down to 4000 pounds for the complete unit. Four valves are provided for each cylinder, each of which is operated by an individual push rod driven from the camshaft. Extensive use has been made of aluminum in the construction of this motor to keep the weight limits down as low as consistent

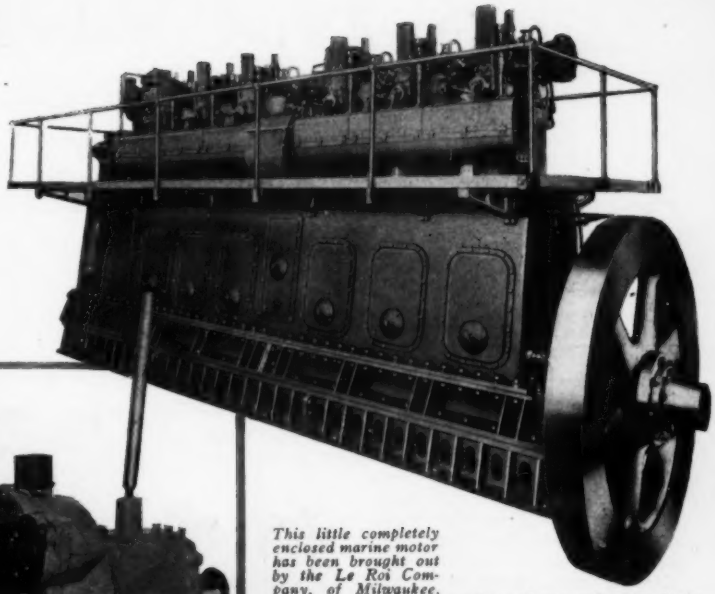


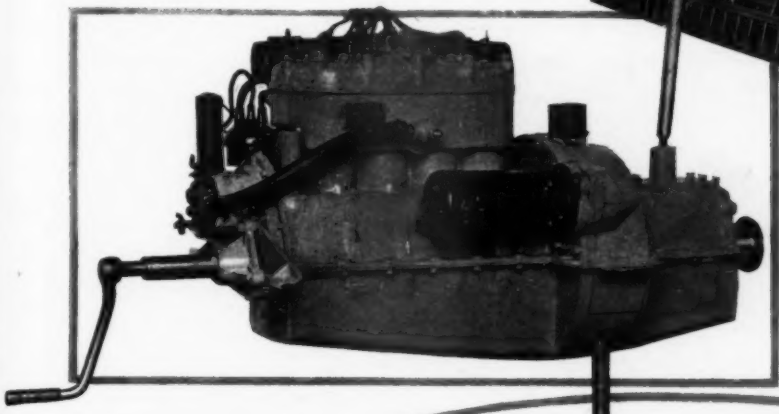
The 12-cylinder Allison motor which is a new development in high speed marine power plants. These motors will develop 500 h. p. when called on and are rated conservatively at 400 h. p. when turning at 1300 revolutions. No expense has been spared in the design or construction of these machines and they are eminently suited for the finest cruisers and yachts



Palmer Brothers at Cos Cob, Connecticut, have just brought out this new model V H 4-cylinder machine. This is of the semi-high speed four-cycle type with valves in the head operated by an overhead camshaft. The entire cylinder casting is a single block for the four cylinders. It is equipped with a clutch which is entirely enclosed and further is equipped with all electrical accessories such as starting motor and generator

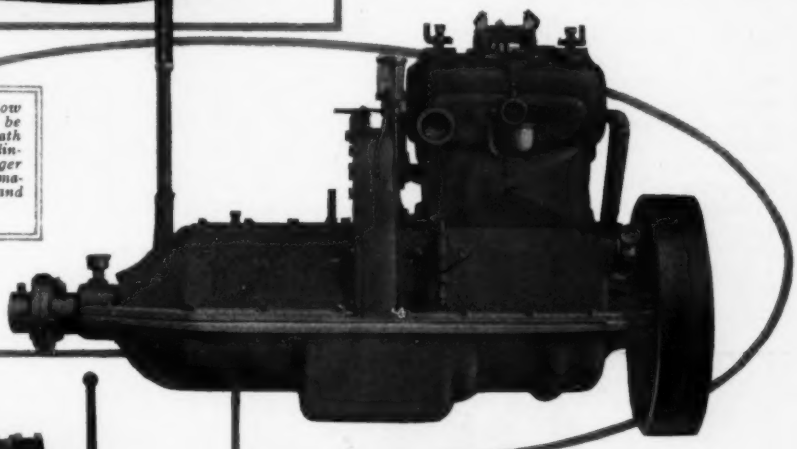
The most recent addition to the list of commercial engine designs of the New London Ship and Engine Company. A 600 h. p. unit of the vertical six cylinder four-cycle type which develops its power at 225 revolutions. Can be built as a directly reversible unit when required and is designed for use aboardship in driving electric generators or coupled directly to the propeller

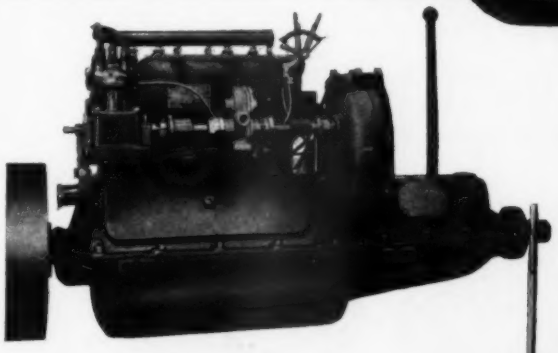




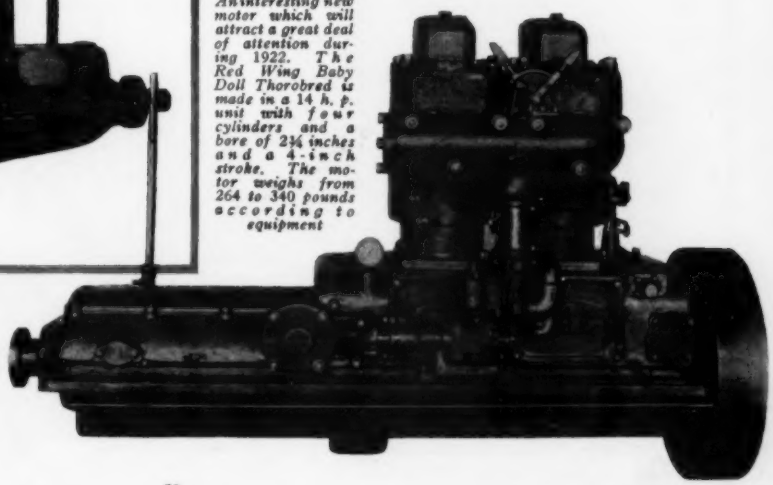
This little completely enclosed marine motor has been brought out by the Le Roi Company, of Milwaukee, Wisconsin, for use in small runabouts and motor boats. It is designed to develop 15 h. p. and all of the newest developments in engineering have been incorporated in it. It is especially adapted to stand up under the severe requirements of marine service. Special attention has been paid to economy and efficiency in operation.

Among the small motors which are now being brought out so generally will be found this new two-cylinder Kermath made in two sizes. These are two-cylinder units of the same size as the larger and better known four-cylinder machines and are rated at 4-5 h. p. and 6-7 h. p. respectively.





An interesting new motor which will attract a great deal of attention during 1922. The Red Wing Baby Doll Thorobred is made in a 14 h. p. unit with four cylinders and a bore of 2¼ inches and a 4-inch stroke. The motor weighs from 264 to 340 pounds according to equipment



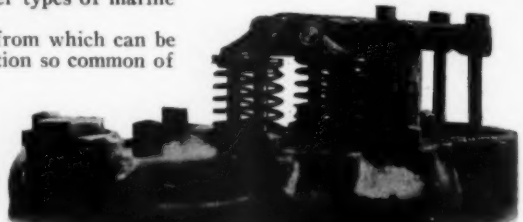
The Fristbie Motor Company are springing a surprise in their newest heavy duty motor. Known as model T this machine, in the two-cylinder size illustrated, will develop 20 h. p. at about 600 r. p. m. A four-cylinder machine of the same bore and stroke, that is, 6 by 6 inches, is rapidly being completed and will shortly be ready also. A high speed model of the same type designed to run up to 1200 revolutions will develop not less than 100 h. p.

New Two-Cylinder Frisbie Motor

A New Model Valve-in-Head Motor Developed to Meet the Demand for Medium Speed Combined With Rugged Construction

TO meet the requirements of those persons who wanted in a medium-speed strongly constructed motor the refinements found in high-powered high-speed motors, the Frisbie Motor Company of Middletown, Conn., have developed and are now offering their model T, 2-cylinder, 4-cycle, 20 horsepower motor. In this motor is incorporated the knowledge of valve-in-head design learned by twenty years of experience in building that type of motor, and the general knowledge learned through more than twenty years of building other types of marine motors.

This new Frisbie motor is one from which can be obtained the sturdy, reliable operation so common of the Frisbie motors, together with refinements leading towards quietness and cleanliness of operation that has heretofore been impossible to obtain in that class of work. Four valves are used in each cylinder instead of the customary two, two intake and two exhaust. In this way the two small intake or exhaust valves give the same large area that would result from the use of one large intake or exhaust valve, and at the same time, because of the comparatively small diameter of the valves themselves, the danger of warping or cracking of valves is correspondingly less than with the large diameter valves. Because of these small valves lighter valve springs can be used, greatly reducing the noise of the valve actuating mechanism. The intake valves run across the cylinder, as do the exhaust valves also, instead of lengthwise of the cylinder as has been customary in other four-valve-to-the-cylinder motors, and in this way the rocker arm actuates two valves. The actuation from the push rod end is the same as always with the adjustment of the push rod coming on the top end, while from the other end of the rocker arm there is used an equalizer insuring the synchronism of the opening and closing in both valves.



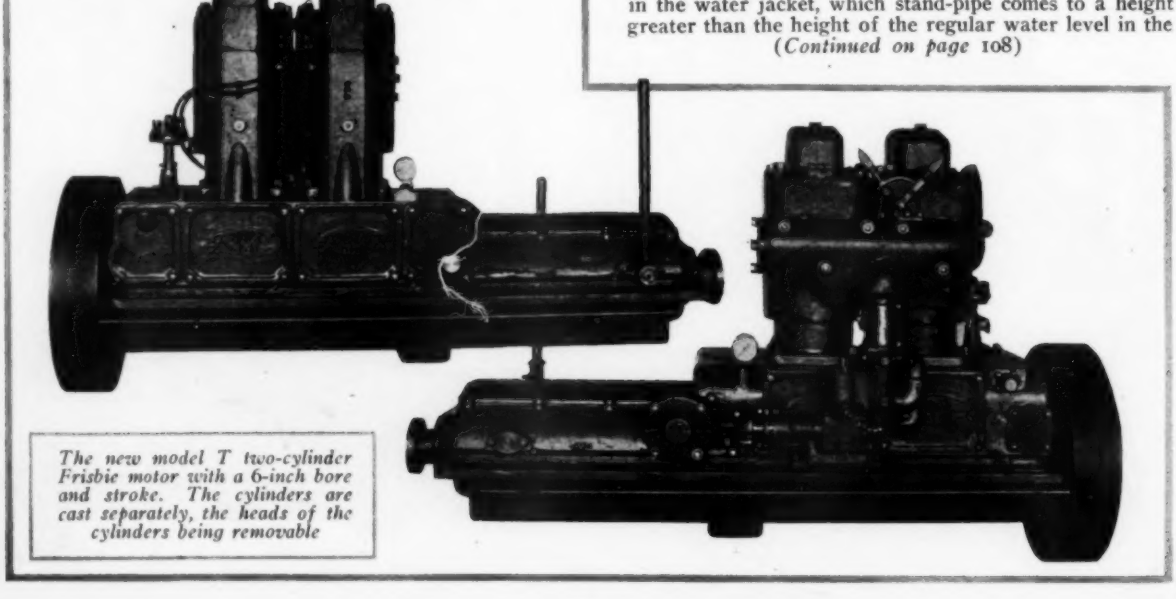
Illustrating cylinder head and rocker arm mechanism, with rocker arm cover and studs removed

This new motor has cylinders of 6-inch bore with stroke of 6 inches. The cylinders are cast separately, the heads being removable.

In all valve-in-head motors it is imperative that the valves be truly accessible, thus necessitating the use of either a valve cage or a detachable head. Frisbie motors have been of the cage type of valve, while in this new motor the cage is not used, the valve being in a detachable head instead. Heretofore with detachable head for the overhead valve motors the accessibility of the valve has been lessened because of the reason that exhaust or intake manifolds, water pipes, spark plug wires, and other connections must be removed before the head can be taken off the cylinder, but in this new model T Frisbie motor one of the big outstanding features of design is that part which brings into use gas passages cast within the cylinder heads leading from the valve apertures down on the side of the cylinders to a point lower than that at which the break for the head is to be made. This makes possible a cylinder head which can be removed without touching the exhaust or intake line, water pipes, spark plug wires, or any connection at all. All that is necessary is to take off the nuts on the cylinder head studs, and the head itself can then very quickly be jacked up.

To further facilitate the removal of the cylinder head, in each head there are two jack screws, which, after the stud nuts are removed, can be screwed down upon, lifting the head without the use of a chisel or a screwdriver breaking the cylinder head gaskets. The packing surface for the gasket itself is very large, there being no point where it is less than 1½ inches in width and the use of copper asbestos-lined gaskets gives one that can be used over and over again without leaking. Another unusual point in this cylinder head is the use of a water stand-pipe, placed in the water jacket, which stand-pipe comes to a height greater than the height of the regular water level in the

(*Continued on page* 108)



The new model T two-cylinder Frisbie motor with a 6-inch bore and stroke. The cylinders are cast separately, the heads of the cylinders being removable

American Manufacturers of Two-Cycle Marine Motors

An Alphabetical List of Two-Cycle Marine Motors with the Names and Addresses of Their Manufacturers Giving the Range of Power Produced by Each

Two-Cycle Marine Motor Manufacturers

Acadia.....Acadia Gas Engines, Ltd., Bridgewater, N. S.
3, 4, 5, 6½, 8, 10, 13, 16, 24 H. P. 1-3 cyls.

American.....American Engine Co., Detroit, Mich.
2½, 4, 6, 8, 14, 20 H. P. 1-2 cyls.

Amphion.....Allen, Clarence J., Amphion Marine Engines, 645 South Pierce St., Milwaukee, Wis. 3 H. P. 2 cyl.

Barber.....King Brothers, 439 E. Water St., Syracuse, N. Y.
2½, 5 H. P. 1-2 cyls.

Barker.....Barker Factory, Norwalk, Conn.
1¼, 2½, 4, 6½, 8 H. P. 1-2 cyls.

Bridgeport.....Bridgeport Motor Co., Inc., Bridgeport, Conn.
4½, 6, 8, 11, 9, 12, 16 H. P. 1-2 cyls.

Brown-Talbot.....Brown-Talbot Machinery Co., Salem, Mass.
5, 10, 15, 20, 30 H. P. 1-3 cyls.

Bud-E.....Carlyle Johnson Machine Co., Manchester, Conn.
5 H. P. 2 cyls.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, New York.
1½, 3, 4, 6, 8 H. P. 1-2 cyls.

Caille.....Caille Perfection Motor Co., Detroit, Mich.
2½, 4, 6, 8, 14, 20 H. P. 1-4 cyls.

Chesapeake.....Chesapeake Engine Co., Oxford, Md.
4, 6, 12 H. P. 1-2 cyls.

Evinrude.....Evinrude Motor Co., Milwaukee, Wis.
2, 5 H. P. 1-2 cyls.

Foreman.....Foreman Motor & Machine Co., Ltd., Toronto, Can.
12 H. P. 2 cyls.

Frazer Adams.....Frazer Brothers Co., Adams, New York.
2, 4, 5, 10 H. P. 1-2 cyls.

Gaffga.....J. S. Gaffga & Sons, Greenport, New York.
3, 4, 5, 6, 8, 10, 12, 16 H. P. 1-2 cyls.

Gray.....Gray Motor Corp., Mach. & D. T. R. R., Detroit, Mich.
4, 7, 8 H. P. 1-2 cyls.

Hartford.....The Gray & Prior Machine Co., 56 Suffield St., Hartford, Conn. 5, 8, 10, 20 H. P. 1-2 cyls.

Harvey.....Harvey Marine Motor Co., 82 Harvard St., Rochester, N. Y. 7, 16, 24, 32, 48 H. P. 1-6 cyls.

H. L. B......Henry L. Brownback, Norristown, Pa.
1½, 3 H. P. 2-4 cyls.

Imperial.....Bruce Stewart Co., Ltd., Charlottetown, P.E.I., Canada.
4, 5, 10, 15, 20, 30 H. P. 1-3 cyls.

Knox.....Camden Anchor-Rockland Machine Co., Camden, Me.
3, 4½, 5½, 6, 7½, 9, 11, 15 H. P. 1-2 cyls.

Lathrop.....J. W. Lathrop & Co., Mystic, Conn.
3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, 36 H. P. 1-3 cyls.

Lazier.....Lazier Gas Engine Co., Buffalo, N. Y.
50, 100, 150, 200, 300 H. P. 1-6 cyls.

L. & D......L. & D. Tool Works, 75 Prospect Ave., Hartford, Conn.
3 H. P. 1 cyl.

L-A.....Lockwood-Ash Motor Co., Jackson, Mich.
2½, 4, 6, 8, H. P. 1-2 cyls.

Mianus.....Mianus Motor Works, Stamford, Conn.
3, 5, 6, 7½, 10, 15 H. P. 1-2 cyls.

Missouri.....Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.
7, 14, 22, 30 H. P. 1-4 cyls.

Mohawk.....S. R. Manufacturing Co., Schenectady, New York.
3½, 5, 6, 7, 10, 12, 16, 18, 21, 30 H. P. 1-3 cyls.

Motorgo.....Sears Roebuck Co., Chicago, Ill.
2½, 4, 6, 8 H. P. 1-2 cyls.

Olympic.....Woodhouse-Schmitz Engine Co., Seattle, Wash.
4, 8 H. P. 1-2 cyls.

Ontario.....A. E. Olmstead & Sons, Pulaski, New York.
2, 3, 5, 6, 9, 10, 12, 15, 20 H. P. 1-4 cyls.

Palmer.....Palmer Bros. Engines Inc., Cos Cob, Conn.
2½, 4, 5, 6 H. P. 1-2 cyls.

Pierce.....Pierce Motor Co., Bay City, Mich.
6, 15, 25, 40, 60 H. P. 1-6 cyls.

Roberts.....Roberts Motors Co., Sandusky, Ohio
4, 8, 16 H. P. 1-4 cyls.

St. Lawrence.....St. Lawrence Eng. Co., Ltd., Brockville, Ont.
3, 4, 6, 8, 12, 18 H. P. 1-3 cyls.

Superior.....Superior Motor Works, Titusville, Fla.
5, 10 H. P. 1-2 cyls.

Union.....Union Gas Engine Co., Kennedy & Boehmer Sts., Oakland, Cal.
7, 14, 21, 28, 35, 45, 60, 80, 85, 110, 150, 225, 250 H. P. 1-4 cyls.

Waterman-Arrow....Arrow Motor & Machine Co., Newark, N. J.
3, 5, 6 H. P. 1-2 cyls.

Winona.....Winona Machine & Boat Works, Winona, Minn.
5, 10 H. P. 1-2 cyls.

Two-Cycle Outboard Motor Manufacturers

Amphion.....Clarence J. Allen, Amphion Marine Engines, 645 S. Pierce St., Milwaukee, Wis. 3 H. P. 2 cyls.

Aerothrust.....Aerothrust Engine Co., La Porte, Ind.
3, 5 H. P. 2 cyls.

Caille 5-Speed.....Caille Perfection Motor Co., Detroit, Mich.
2 H. P. 1 cyl.

Elto Twin.....Elto Outboard Motor Co., Milwaukee, Wis.
3 H. P. 2 cyls.

Evinrude.....Evinrude Motor Co., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Gierholtt.....Gierholtt Gas Motor Co., Marine City, Mich.
2 H. P. 1 cyl.

Johnson.....Johnson Motor Co., South Bend, Ind.
2 H. P. 2 cyls.

Joymotor.....Joymotor Mfg. Co., 1414 S. Michigan Ave., Chicago, ill.
1½ H. P. 1 cyl.

Koban.....Koban Manufacturing Co., 241 So. Water St., Milwaukee, Wis. 3 H. P. 2 cyls.

L-A.....Lockwood-Ash Motor Co., Jackson, Mich.
2½, 4, 6, 8 H. P. 1-2 cyls.

Liberty Drive.....Caille Perfection Motor Co., Detroit, Mich.
2 H. P. 1 cyl.

Miller.....Miller Engine Co., 2329-31 N. Talman Ave., Chicago, Ill.
2½ H. P. 1 cyl.

Motorgo.....Sears Roebuck & Co., Chicago, Ill.
2 H. P. 1 cyl.

Neptune.....Caille Perfection Motor Co., Detroit, Mich.
2 H. P. 1 cyl.

Waterman-Arrow....Arrow Motor & Machine Co., Newark, N. J.
3 H. P. 1 cyl.

Wisconsin.....Wisconsin Machinery & Mfg. Co., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Manufacturers of Heavy Oil Engines

Four-Cycle Heavy Oil Engine Manufacturers

Atlas Diesel.....Atlas Imperial Engine Co., Oakland, Cal.
100 H. P. and up. 4-6 cyls.

Cummins.....Cummins Engine Co., 7th & Jackson Sts., Columbus, Ind.
8, 16, 24, 32 H. P. 1-4 cyls.

Dodge.....Dodge Manufacturing Co., Mishawaka, Ind.
12½, 25, 37½, 50, 75 H. P. 1-6 cyls.

Dow.....Dow Pump & Diesel Co., Alameda, Cal.
75, 100, 150, 200, 320, 500, 665 H. P. 3-8 cycls.

Fulton.....Fulton Mfg. Co., Erie, Pa.
50, 70, 100 H. P. 3-6 cyls.

Hvid.....Pittsburgh Filter & Engineering Co., Pittsburgh, Pa.
50, 75, 100, 150 H. P. 2-6 cyls.

Ingersoll-Rand P. R. Type..Ingersoll-Rand Co., 11 Broadway, N. Y.
220, 300, 500 H. P. 6 cyls.

McIntosh & Seymour..McIntosh & Seymour Corp., Auburn, New York.
390, 640, 1200, 1400, 2250, 3000 H. P. 6 cyls.

Midwest Diesel.....Midwest Engine Co., Indianapolis, Ind.
60, 90, 120, 180 H. P. 2-6 cyls.

Missouri.....Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.
7, 14, 22, 30 H. P. 1-4 cyls.

Nelseco.....New London Ship & Engine Co., Groton, Conn.
120, 180, 240, 360, 480, 750 H. P. 4-8 cyls.

Nordberg.....Nordberg Manufacturing Co., Milwaukee, Wis.
330 to 2800 H. P.

Pittsburgh.....Pittsburgh Filter & Eng. Co., 280 Broadway, New York.
50, 75, 100, 150 H. P. 2-6 cyls.

Price-Rathbun.....Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
220, 300, 500, 750 H. P. 6 cyls.

Quayle.....Commonwealth Motors Co., 326 W. Madison St., Chicago, Ill. 30 H. P. 4 cyls.

Union.....Union Gas Engine Co., Kennedy & Boehmer Sts., Oakland, Cal.
125, 225, 300, 327, 375 H. P. 4-6 cyls.

Werkspoor.....Pacific Diesel Engine Co., Oakland, Cal.
100, 150, 200, 300, 450, 600, 850, 1100, 1500, 2000, 3000 H. P. 2-8 cyls.

Western.....Western Machinery Co., Los Angeles, Cal.
25, 50, 75, 100, 150 H. P. 1-6 cyls.

Winton.....Winton Engine Works, 2116 W. 106th St., Cleveland, O.
50, 75, 115, 150, 225, 300, 450 H. P. 3-8 cyls.

Wolverine.....Wolverine Motor Works, Inc., 35 Union Ave., Bridgeport, Conn. 20, 40, 60, 80 H. P. 1-4 cyls.

Wygosky.....Baltimore Oil Engine Co., 6501 Eastern Ave., Baltimore, Md. 50, 60 H. P. 1 cyl.

Two-Cycle Heavy Oil Motor Manufacturers

Bolinders.....Bolinders Co., 30 Church St., New York, N. Y.
500 H. P. 1-4 cyls.

Busch-Sulzer.....Busch-Sulzer Bros.-Diesel Engine Co., 2nd and Utah Sts., St. Louis, Mo.
650, 1000, 1300, 2000, 2500 H. P. 4-6 cyls.

Fairbanks-Morse C.O..Fairbanks-Morse Co., 900 So. Wabash Ave., Chicago, Ill
30, 45, 60 ,75, 100, 150, 200, 300 H. P. 2-6 cyls.

Hadfield-Penfield...Hadfield-Penfield Steel Co., Bucyrus, O.
50, 125, 250, 500, 750 H. P. 2-6 cyls.

Kahlenberg.....Kahlenberg Bros. Co., Two Rivers, Wis.
36, 54, 60, 70, 90, 120, 150, 200 H. P. 2-4 cyls.

Lazier.....Lazier Gas Engine Co., 190 Main St., Buffalo, N. Y.
50, 100, 150, 200, 300 H. P. 1-6 cyls.

Mianus.....Mianus Motor Works, Stamford, Conn.
7½, 15, 30, 45, 60, 90 H. P. 1-6 cyls.

Mietz.....Aug. Mietz Corp., 430 E. 19th St., N. Y.
15, 60, 75, 350 H. P. 2-4 cyls.

Missouri.....Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.
7, 14, 22, 30 H. P. 1-4 cyls.

Nordberg.....Nordberg Mfg. Co., Milwaukee, Wis.
300, 500, 800, 1200, 1650, 2500 H. P. 4-6 cyls.

Remington.....Remington Oil Engine Co., Stamford, Conn.
7, 10, 11, 14, 17, 22, 24, 35, 55, 75 H. P. 1-4 cyls.

Skandia.....Pacific Diesel Engine Co., Oakland, Cal.
9, 16, 24, 36, 38, 55, 70, 100, 120, 140, 200, 240, 360, 500 H. P. 1-6 cyls.

Venn-Severin.....Venn-Severin Machine Co., 1317 W. North Ave., Chicago, Ill.
10, 20, 25, 40, 45, 70, 150, 200 H. P. 1-4 cyls.

Weiss.....Weiss Engineering Co., 17 Battery Place, N. Y.
45, 60, 75, 120, 150, 200, 225, 300, 400 H. P. 3-4 cyls.

Wygosky.....Baltimore Oil Engine Co., 6501 Eastern Ave., Baltimore, Md. 15, 300 H. P. 1-6 cyls.

American Manufacturers of Four-Cycle Motors

An Alphabetical List of Four-Cycle Marine Motors with the Name and Addresses of Their Manufacturers, Giving the Range of Powers Produced by Each

Four-Cycle Gasoline and Kerosene Engines

Acadia.....Acadia Gas Engines Ltd., Bridgewater, N. S., Can.
10, 16, 20, 30, 40, 60 H. P. 1-4 cyls.

Acme.....Acme Engine Co., 163 Main St., San Francisco, Cal.
8, 10, 16, 20, 25, 35, 40, 45, 50, 55, 65, 80, 85, 100, 125 H. P. 1-6 cyls.

Atlas Imperial.....Atlas Imperial Engine Co., Ft. 19th Ave., Oakland, Cal.
6, 8, 10, 12, 16, 20, 30, 35, 45, 50, 55, 60, 80, 90, 110, 125, 150 H. P. 1-4 cyls.

Anderson.....Anderson Engine Co., 4036 N. Rockwell St., Chicago, Ill.
4½, 8½, 12½, 25, 50 H. P. 1-4 cyls.

Automatic.....Automatic Machine Co., Bridgeport, Conn.
30, 40, 45, 50, 60, 70, 75, 90, 100, 105, 120, 150, 200, 250 H. P. 3-6 cyls.

Barber.....King Bros., 439 E. Water St., Syracuse, N. Y.
3, 8 H. P. 1-2 cyls.

Boyer.....Boyer Machine Co., East Oakland, Cal.
5, 10 H. P. 1-2 cyls.

Brennan.....Brennan Motor Mfg. Co., Syracuse, N. Y.
20, 35, 40, 50, 60 H. P. 4-6 cyls.

Bridgeport.....Bridgeport Motor Co., Inc., Bridgeport, Conn.
14, 20, 30, 45, 60 H. P. 2-4 cyls.

Buffalo.....Buffalo Gasolene Motor Co., Buffalo, N. Y.
4, 6, 12, 15, 20, 22, 24, 30, 45, 60, 70, 80, 100, 150 H. P. 1-6 cyls.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, N. Y.
16 H. P. 4 cyls.

Caille.....Caille Perfection Motor Co., Detroit, Mich.
14 H. P. 4 cyls.

Capitol.....Auto Engine Works, University & Griggs, St. Paul, Minn.
32, 65 H. P. 4 cyls.

Carl.....Carl Engine & Machine Works, 103 N. 2nd St., Phila., Pa.
4, 5, 8, 9, 10, 18, 24, 28, 40 H. P.

Chesapeake.....Chesapeake Engine Co., Oxford, Md.
4, 7, 8, 20 H. P. 1-4 cyls.

Clay.....Clay Engine Mfg. Co., 864 East 72nd St., Cleveland, Ohio
4, 6, 8, 10, 12, 16, 20, 25, 35, 50, 80, 100 H. P. 1-4 cyls.

Curtiss.....Curtiss Aeroplane and Motor Corp., Garden City, L. I., N. Y.
90, 150, 160, 375, 400 H. P. 6-12 cyls.

Doak.....Doak Gas Engine Co., Oakland, Cal.
30, 40, 45, 60, 75, 90, 100, 150, 200, 300 H. P. 2-6 cyls.

Doman.....Universal Products Co., Oshkosh, Wis.
4, 7, 15, 25, 40, 50 H. P. 1-4 cyls.

Dunn.....Dunn Motor Works, Ogdensburg, New York.
2, 4, 6, 8, 12, 16, 24 H. P. 1-6 cyls.

Du Pont.....E. Paul du Pont, Del. Trust Bldg., Wilmington, Del.
20, 40, 60 H. P. 2-6 cyls.

Easthope.....Easthope Bros., 1729 Georgia St., Vancouver, B. C.
4, 7, 8 H. P. 1-2 cyls.

Elco.....Elco Co., Bayonne, N. J.
65, 100 H. P. 4-6 cyls.

Enterprise.....Enterprise Foundry Co., Southern Pacific Bldg., San Francisco, Cal.
6, 8, 10, 12, 16, 20, 30, 35, 45, 55, 60, 80 H. P. 1-3 cyls.

Erd.....Erd Motor Co., Saginaw W. S., Mich.
35, 38 H. P. 4 cyls.

Evansville.....Evansville Gas Engine Works, Evansville, Ind.
3¾, 5, 7½, 8, 10, 11, 15, 16, 20, 22, 24, 32, 44 H. P. 1-4 cyls.

Fay & Bowen.....Fay & Bowen Engine Co., Geneva, N. Y.
17, 22, 40, 45, 50, 85 H. P. 4 cyls.

Fisherman.....Loane Engineering Co., Baltimore, Md.
3½, 6, 12, 18, 24 H. P. 1-4 cyls.

Foreman.....Foreman Motor & Machine Co., Ltd., Toronto, Can.
20, 40, 60 H. P. 2-6 cyls.

Frisbie (Valve-in-Head)..Frisbie Motor Co., College St., Middletown, Conn.
5, 7, 10, 16, 18, 20, 25, 30, 40, 50, 75, 100 H. P. 1-3 cyls.

Frisco Standard.....Standard Gas Engine Co., Dennison & King Sts., East Oakland, Cal.
5, 8, 10, 12, 16, 20, 30, 40, 50, 65, 80, 85, 110, 120, 175, 275 H. P. 1-6 cyls.

Gaeth.....Gaeth Motor Co., 2101 Abbey Ave., Cleveland, Ohio
18, 27, 36, 50, 54, 75 H. P. 2-6 cyls.

G. B. S......Golden, Belknap & Swartz Co., 5432 Grand River Ave., Detroit, Mich. 20 H. P. 4 cyls.

Gaffga.....J. S. Gaffga & Sons, Greenport, N. Y.
12 H. P. 4 cyls.

Gray Prior.....Gray Prior Machine Co., 56 Suffield St., Hartford, Conn.
36 H. P. 4 cyls.

Gray.....Gray Motor Corporation, Mack & D. T. R. R., Detroit, Mich. 25, 35, 50 H. P. 4 cyls.

Guarantee.....Guarantee Motor Co., 369 Bay St., North, Hamilton, Ont., Can.
3½, 6, 8, 10, 12, 16, 20, 25, 50 H. P. 1-4 cyls.

Hall-Scott.....Hall-Scott Motor Car Co., Berkeley, Cal.
125, 200 H. P. 4-6 cyls.

Hess.....Hess Motor Co., Detroit, Mich.
4 H. P. 1 cyl.

Hettinger.....Hettinger Engine Co., Bridgeton, New Jersey.
6, 12, 18, 25, 36, 50 H. P. 1-4 cyls.

H. L. B......H. L. Brownback Co., Norristown, Pa.
4 H. P. 2 cyls.

Hicks.....Hicks Iron Wks., 967 Howard St., San Francisco, Cal.
6, 8, 10, 12, 16, 20, 30, 35, 80 H. P. 1-3 cyls.

J. V. B......J. V. B. Engine Co., 195 Kenmore Blvd., Akron, Ohio.
40, 60 H. P. 4 cyls.

Kermath.....Kermath Mfg. Co., 5880 Commonwealth, Detroit, Mich.
3, 5, 8, 12, 18, 25, 40 H. P. 1-4 cyls.

Knox.....Camden Anchor-Rockland Mach. Co., Camden, Me.
6, 8, 12, 16, 25, 50, 75 H. P. 1-6 cyls.

Knox (Valve-in-Head)..Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.
20, 40 H. P. 4 cyls.

Lathrop.....J. W. Lathrop & Co., Mystic, Conn.
12, 16, 21, 28, 30, 40 H. P. 2-4 cyls.

Le Roi.....Le Roi Company, Milwaukee, Wis.
15 H. P. 4 cyls.

Liberty Kid.....A. G. Hebgen, 440 Market St., San Francisco, Cal.
4, 8, 16 H. P. 1-4 cyls.

Lisk.....Lisk Machine & Tool Wks., 4129 West Jefferson, Detroit, Mich. 25 H. P. 4 cyls.

L-A.....L-A Motor Co., Jackson, Mich.
18 H. P. 4 cyls.

Matthews.....Matthews Engineering Co., Sandusky, Ohio.
2½, 5, 20, 30 H. P. 1-4 cyls.

Maynard-Adams.....Maynard-Adams Eng. Co., 8th and Delaware, Berkeley, Cal. 3½ H. P. 1 cyl.

Mianus.....Mianus Motor Works, Stamford, Conn.
16, 24, 32 H. P. 2-4 cyls.

Michigan.....Michigan Marine Motor Corp., 7237 E. Jefferson, Detroit, Mich. 4 H. P. 4 cyls.

Miller.....Miller Engine Co., 2329-31 N. Talman Ave., Chicago, Ill.
4, 6, 10, 14, 20, 24, 30, 35, 50 H. P. 1-4 cyls.

Missouri.....Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.
8, 16, 24, 36, 60 H. P. 2-6 cyls.

Monarch.....Grand Rapids Gas Engine Co., Grand Rapids, Mich.
26, 39, 40, 52, 60, 78, 80, 120 H. P. 2-6 cyls.

Motorgo.....Sears, Roebuck & Co., 925 Homan Ave., Chicago, Ill.
16 H. P. 4 cyls.

Murray & Tregurtha..Murray & Tregurtha Corp., Atlantic, Mass.
14, 20, 35, 70, 85, 110, 140, 150, 200, 300 H. P. 2-6 cyls.

N. J. M......New Jersey Motor Sales Co., Keyport, N. J.
15 H. P. 4 cyls.

Niagara.....Niagara Motors Corp., Dunkirk, N. Y.
12, 15, 35, 80, 120, 160 H. P. 2-8 cyls.

Nieland.....J. E. Nieland & Co., 1728 Bryant St., San Francisco, Cal.
1½, 2, 2½, 4, 6, 8, 12, 16, 18, 20, 24 H. P. 1-3 cyls.

N. & S......N. & S. Engine Co., 1144-1156 Elliot Ave. W., Seattle, Wash. 4, 20, 30, 40, 80 H. P. 1-3 cyls.

Olympic.....Woodhouse Gasoline Engine Co., Seattle, Wash.
4, 8 H. P. 1-2 cyls.

Oswald.....Oswald Gasoline Motor Co., 3101 Turk St., San Francisco, Cal. 5 H. P. 1 cyl.

Pacific.....Pacific Marine Eng. Co., Seattle, Wash.
7 H. P. 1 cyl.

Palmer.....Palmer Bros. Engines, Inc., Cos Cob, Conn.
2, 3½, 6, 6½, 7, 10, 12, 14, 18, 24, 25, 26, 35, 50 H. P. 1-4 cyls.

Peerless.....Peerless Marine Motor Corp., 2150 Niagara St., Buffalo N. Y.
6, 12, 20, 24, 35, 50, 125, 250, 450 H. P. 1-2 cyls.

Philadelphia.....Central Machine Co., 7th and Wood, Philadelphia, Pa.
3, 8, 12, 16, 25 H. P. 1-4 cyls.

Red Wing.....Red Wing Motor Co., Red Wing, Minn.
14, 20, 24, 36, 40 H. P. 4 cyls.

Regal.....Regal Gasoline Engine Co., Coldwater, Mich.
2, 4, 5, 7, 9, 8, 10, 14, 16, 18, 20, 30, 32, 36, 50, 100 H.P. 1-8 cyls.

Reliable.....Reliable Tractor & Engine Co., Portsmouth, Ohio.
10, 16, 20, 25, 32, 45, 55 H. P. 2 cyls.

Roberts.....Roberts Motors, Sandusky, Ohio.
8 H. P. 2 cyls.

St. Lawrence.....St. Lawrence River Motor & Machine Co., Clayton, N.Y.
15 H. P. 4 cyls.

Scripps.....Scripps Motor Co., 5817 Lincoln Ave., Detroit, Mich.
12, 18, 40, 55, 60, 85 H. P. 4 cyls.

Speedway.....Consolidated Shipbuilding Corp., Morris Heights, N.Y.
28, 44, 66, 75, 115, 130, 150, 165, 175, 200, 250, 300 H. P. 4-8 cyls.

Standard.....Standard Motor Construction Co., 172 Whitton St., Jersey City, N. J.
12, 18, 24, 27, 37, 54, 60, 75, 90, 100, 150, 200, 300, 500 H. P. 2-6 cyls.

Stearns.....Stearns Motor Co., Ludington, Mich. 45, 50, 60, 75, 100 H. P. 4 cyls.

Sterling.....Sterling Engine Co., 1254 Niagara St., Buffalo, N. Y.
10, 15, 25, 55, 85, 100, 115, 125, 145, 150, 170, 200, 225, 250, 275, 300 H. P. 2-8 cyls.

Sturtevant E 4.....B. F. Sturtevant Co., Hyde Park
75 H. P. 4 cyls.

Superior.....Superior Motor Works, Titusville, Fla.
12, 25 H. P. 2-4 cyls.

Twentieth Century..New York Yacht, Launch & Engine Co., Morris Heights, N. Y. 40, 50, 67, 75 H. P. 4-6 cyls.

Ultra.....Werner Motor Co., Bowling Green, Ohio.
30 H. P. 6 cyls.

Union.....Union Gas Engine Co., Oakland, Cal.
5, 12, 20, 35, 45, 60, 80, 85, 110, 125, 150, 225, 250, 300, 325, 375 H. P. 1-6 cyls.

Universal.....Universal Motor Co., Oshkosh, Wis.
10 H. P. 4 cyls.

Van Blerck.....Van Blerck Motor Co., Monroe, Mich.
100, 150, 200, 1500 H. P. 4-8 cyls.

Vulcan.....Vulcan Engine Works, 1827 Bainbridge, Philadelphia, Pa.
4, 5, 8, 10, 15, 16, 20, 25, 30, 37½, 50, 75 H.P.1-4 cyls.

Western.....Western Machinery Co., 900 N. Maine St., Los Angeles Cal. 75, 100, 150 H. P. 3-6 cyls.

White & Middleton...Chas. White Gas Engine Co., Baltimore, Md.
4 to 50 H. P. 1-4 cyls.

Winona.....Winona Machine & Boat Works, Winona, Minn.
28 H. P. 4 cyls.

Wisconsin.....Wisconsin Motor Mfg. Co., 4th and Burman St., Milwaukee, Wis.
24, 40, 50, 60, 62, 90 H. P. 4-6 cyls.

Winton.....Winton Engine Wks., 2116 West 106th St., Cleveland, O.
80, 125, 150, 200 H. P. 6-8 cyls.

Wolverine.....Wolverine Motor Works, Inc., Bridgeport, Conn.
40, 110, 160, 200 H. P. 3-6 cyls.

Wood & Chute.....Wood & Chute, Inc., Greenport, N.Y.
16, 24, 32 H. P. 2-4 cyls.

Wright Reliable.....Wright Machine Co., Owensboro, Ky.
10, 15, 20, 30, 40, 45, 60, 70 H. P. 1-6 cyls.

Builders of Stock Boats for 1922

An Alphabetical List of Manufacturers of Stock Boats Whose Products Are Listed Under Their Trade Name Below

Trade Name	Manufacturer and Address
Albany	Albany Boat Corporation, Watervliet, New York.
American	American Boat Co., Detroit, Mich.
Apelcraft	Ventnor Boat Works, 5th & C Ave., Ventnor, Atlantic City, N. J.
B. & E	Bair & Edgerton, Glen Cove, Long Island, N. Y.
Belle Isle	Belle Isle Boat & Engine Co., Detroit, Mich.
Burger Cruiser	Burger Boat Company, Manitowoc, Wis.
Canadian	Canadian Boat & Engine Exchange, 43 York St., Toronto, Ont.
Cape Cod	Cape Cod Shipbuilding Corp., 367 Main St., Wareham, Mass.
Chesapeake	Whittington Boat Co., Crisfield, Md.
Cinderella	Reliance Motor Boat Co., 207th St., New York, N. Y.
Consolidated	Consolidated Shipbuilding Corp., Morris Heights, N.Y.
Crescent	Crescent Motor Boat Co., Clayton, New York.
Cuthbert	A. G. Cuthbert Company, Sandusky, Ohio.
Darrow	Darrow Steel Boat Company, Albion, Mich.
Delanco	Delanco Boat Building Corp., Delanco, N. J.
Dean	Walter Dean Canoe & Boat Co., Ltd., Foot of York St., Toronto, Ont.
Densmore	J. M. Densmore Co., 79 Milk St., Boston, Mass.
Disappearing Propeller	Disappearing Propeller Boat Co., Ltd., Toronto, Can.
Elco	The Elco Works, Bayonne, New Jersey.
Everett Hunter	Everett Hunter Boat Co., McHenry, Ill.
Evinrude	Evinrude Motor Co., Milwaukee, Wis.
Fay and Bowen	Fay & Bowen Engine Co., Geneva, New York.
Gray Boats	Russell Davis Gray, Friendship, Maine.
Great Lakes	Great Lakes Boat Bldg. Corp., Milwaukee, Wis.
Hacker	Hacker Boat Co., Inc., Detroit, Mich.
Haertel	Walter W. Haertel, P. O. Box 333, Sturgeon Bay, Wis.
Harrison	R. W. Harrison Boat Works, Bay View Park, Toledo, O.
International	International Shipbuilding & Marine Engineering Co., Nyack, N. Y.
Liggett	A. G. Liggett & Son Co., Wyandotte, Mich.
Luders	Luders Marine Construction Co., Stamford, Conn.
Mullins	Mullins Body Corporation, Salem, Ohio.
Niagara	Niagara Motor Boat Co., North Tonawanda, New York
Peterborough	Peterborough Canoe Co., Ltd., Peterborough, Ont.
Pyke	Pyke Motor and Yacht Co., Ltd., Montreal, Canada
Ramaley	Ramaley Boat Co., Wayzata, Minn.
Racine	Racine Boat Co., Holborn St., Racine, Wis.
Richardson	Richardson Boat Co., 370 Sweeney St., North Tonawanda, N. Y.
Rochester	Rochester Boat Works, Inc., Rochester, N. Y.
Sea Bright	The Sea Bright Dory Works, 491 Atlantic Ave., Long Branch, N. J.
Skaneateles	Skaneateles Boat & Canoe Co., Skaneateles, N. Y.
Thompson	Thompson Brothers Boat Mfg. Co., Peshtigo, Wis.
Toppan	Toppan Boat Mfg Co., 125 Riverside Ave., Medford Mass.
Tunnel-King	A. R. Williams Machinery Co., Ltd., 64 Front St., W. Toronto, Ont.
Washington	Washington Knock Down Boat Co., 609 W. 40th St., Seattle, Wash.

Stock Boats for 1922

An Index of All Stock Boats Regularly Carried by Various Builders Listed According to Their Size

Lgth. Feet	Trade Name	Type	Beam Feet	Draft Feet	H.P.	R P M	Prop. Ins.	Speed m p h
8	Skaneateles	Dinghy	4-0					
10	American	Dinghy	3-8		2½	800	12	6-7
10	Haertel	Dinghy	3-6	Outboard				
10	Skaneateles	Dinghy	4-0					
12	American	Dinghy	3-11		4	900	12	6-7
13-9	Evinrude	Hunting Skiff	2-11	0-2	2½			
14	American	Dinghy	4-0		4	900	12	6-7
14	Haertel	V-Bottom	3-8	0-8	4	1,000	10x16	10
14	Mullins	Rowboat	3-8					
14	Mullins	Outboard	4-0					
14	Cuthbert	Outboard						
15	Canadian	Launch	4-0	1-0	4	800	12x14	7
15	Belle Isle	Outboard	4-0					
15	Toppan	Rowboat	4-0	Outboard				
15	Racine	Open Boat	4-4	1-2	12			14
15-3	Washington	Outboard	3-10	7	2			7
16	Haertel	Round Bottom	4-2	Outboard				
16	Toppan	Hydroplane			12			
16	Evinrude	Round Bottom	4-0	7½	2½	Out	board	
16	Evinrude	Flat Bottom	3-9	0-2	2½	Out	board	
16	Cape Cod	Open Boat	4-8	12	2½			
16	Darrow	Open Boat	4-0	1-3	0-2	700	10x14	7
16	Belle Isle	Clinker	4-0	1-2	2½	800	10x12	7
16	Cuthbert	Outboard	Motorboat					
16	Dean	Open	4-2	15	2½	800	10x12	8½
16	Mullins	Hydroplane	4-4	1-5	25		16x22	28
16	Mullins	Rowboat	4-2					
16	Mullins	Special	4-0	1-0	5		10x17	7½
16	Peterborough	Tunnel	4-4	6-	3	800	10	8
16	Skaneateles	Outboard	4-0		2			
16	Skaneateles	Dinghy	4-1					
16	Harrison	Open Boat	4-8	1-4	4			7
16½	Disappearing	Propl'r. Launch	4-11		2½			9
17	Dean	Open	4-6	6	2½	800	10x12	8
17	Tunnel King	De Luxe	4-4	0-6	2½	800	9x12	8
17	Tunnel King	Standard	4-4	0-6	2½	800	9x12	8
17	Tunnel King	Mahogany	4-4	0-6	2½	800	9x12	8
17	Darrow	Open Boat	4-4	1-5	3	700	12x16	8
17	Mullins	V-Bottom	4-2	1-3	12		12x15	14
18	Toppan	Dory			3			7
18	Racine	Shallow Draft	5-0	0-9	12			10
18	Darrow	Open Boat	4-4	1-6	3	700	12x16	7
18	B. & E	Vee	4-8	9	14			13
18	Belle Isle	Clinker	4-4	1-4	2½	800	10x12	7
18	Chesapeake	V-Bottom	4-4	16	4	900	13	8-9
18	Cuthbert	Outboard	Motorboat					
18	Peterborough	Regular	4-6	16	6	900	14	11
18	Thompson	Runabout	6-3	1-2	12	1200	14	16
18	Crescent	Skiff	3-6					
18	Crescent	Outboard motor	4-2		2½			8
18	Dean	Midget	4-4		5			11
18	Skaneateles	Cruiser	4-6					
18	Cuthbert	Runabout	5-4	1-6	12		14	14
18½	Disappearing	Propl'r. Launch	4-8		3-3			9
19	Racine	Runabout	4-6	1-4	12			14
19	Darrow	Open Boat	4-6	1-6	6	700	14x16	9
19	Racine	Runabout	4-6	1-8	25			20
19	Racine	Open	4-6	1-4	15			5
19	Crescent	Inboard motor	4-2		8			12
20	Toppan	Dory			6			7½
20	Apelcraft	Runabout	5-0	1-6	15	1500	16x14	15
20	Everett Hunter	Open	4-9	1-4	10	1000	13	12
20	Darrow	Open Boat	4-10	1-8	8	800	14x21	11
20	Harrison	Runabout	4-6	1-10	20			20
20	Thompson	Runabout	4-6	1-4	12	1200	14	15
20	Cape Cod	Dory	5-6	1-8	6	400		8
20	Canadian	Runabout	6-0	1-6	12	1200	14x15	12
20	Peterborough	Round Bottom	4-8	20	12	900	14	12
20	Peterborough	V-Bottom	4-8	22	20	1000	16	18
21	B. & E	Vee	5-10	10	30			25
21	Dean	Runabout	6-4		12	1200		12
21	Haertel	V-Bottom	5-9	1-8	20	1000	18x24	20
21	Toppan	V-Bottom Runabout	6-0		25			20
21	Racine	Shallow Draft	5-4	10	12			11
21	Belle Isle	Runabout	5-8	1-8	20	1000	15x20	18
21	Cuthbert	Runabout	5-8	1-6	30		14	21
21	Mullins	V-Bottom	5-6	1-8	40		16x23	20
21	Hacker	Runabout	6-2	2-0	60	1500	17x22	25
22	Toppan	Dory			12			10
22	Everett Hunter	Open	5-0	1-5	12	1000	14	14
22	Racine	Shallow Draft	5-4	0-10	12			10
22	Ramaley	Runabout	5-6	1-10	20			14
22	Seabright	Dory	6-0	1-8	11	800	20x20	9
22	Richardson	Runabout	5-9	2-0	20	1200	14	18
22-6	Crescent	Runabout	5-0		20			20
23	Racine	Runabout	4-10	1-2	50			28
23	Racine	Runabout	4-10	1-10	50			28
24	Cape Cod	Dory	6-10	2-1	10	500		8
24	Fay & Bowen	Runabout	5-0	1-5	22	1080	16x20	16
24	Darrow	Open Boat	5-6	2-0	14	1100	14x18	14
24	Thompson	Runabout	4-10	1-10	12	1200	14	12
25	Fay & Bowen	Junior Runabout	5-0	1-8	22	1400		16
25	Canadian	Cruiser		2-0	12	900	15x12	8
25	Everett Hunter	Open	5-6	1-5	19	1000	16	6
25	Racine	Runabout	5-2	1-3	85			30
25	Racine	Standing Top	5-6	1-10	35			15
25	Ramaley	Runabout	5-6	1-10	60	1800	16x16	30
25	Hacker	Runabout	5-8	1-9	20	1250	15x20	18
25	Consolidated	Runabout	5-8	1-10	28	1200		16
25	Cuthbert	Runabout	6-2	1-9	100		16	28
25	Racine	Runabout	5-2	2-0	85			30
25	Racine	Open	5-6	1-10	35			18
25	Fay & Bowen	Sport Model	5-4	2-1	50	1400		23
25	Mullins	V-Bottom	6-0	1-10	75		18x23	26
25	Skaneateles	Runabout	5-0		50			20
26	Albany	Runabout	5-6	1-10	28			15
26	Dean	V-Runabout	6-6	18	12	1000	13x14	5
26	Dean	Cabin	8-0	2-5				34
26	Hacker	Runabout	6-6	2-2	100	1400	18x30	35
26	Seabright	Dory	8-0	1-8	16	800	20x22	10
26	Seabright	Cruiser	8-0	1-8	20	800	20x20	10
26	Belle Isle	Bear Cat	6-6	1-11	125	1750	18x24	33
26	Belle Isle	Bear Cat, Jr.	6-2	1-11	75	1500	17x22	25
26	Richardson	Runabout	6-0	2-4	40	1400	16	20
26	Richardson Scout	Cruiser	8-6	2-6	10	600	20	9
26	Reliance	Cinderella	5-2	1-10	100	1400	18	36
27	Belanco	Cruiser	8-6	2-6	20			10
27	Fay & Bowen	Runabout	5-3	1-10	40	1400		19
28	Liggett	V-Bottom	8-6	28	20	1000	20x20	11
28	Washington	Cruiser	7-6	2-8	14	600	24	10
28	Gray Boat	Cruiser	8-8	2-8	20	900		10
28	Ramaley	Runabout	6-0	1-6	60	1500	18x20	28
30	Cape Cod	Cruiser	7-6	2-4	10	600		8
30	Toppan	Open Boat			20			12
30	Toppan	Cruiser			20			10
30	Washington	Fishing Type	8-3	3-0	8	450	24	9
30	Apelcraft	Runabout	6-0	2-0	60	1450	20x22	25
30	Albany	Runabout	6-4	2-2	100		19x32	29
30	Elco	Express	6-2	1-10	60	1400		20
30	Ramaley	Runabout	7-0	1-6	200	1600	18x31	41
30	Reliable	Cinderella	6-6	2-0	200	1400	19	36
30	Racine	Runabout	5-8	2-2	100			35
30	Racine	Open Boat	7-0	2-4	45			18
30	Fay & Bowen	Runabout	5-6	1-11	50	1000		20
31	Racine	V-Bottom Cruiser	7-6	2-2	60			38
32	Albany	Runabout	6-6	2-3	200		19x34	37
32	Consolidated	Runabout	6-0	2-4	66	1200		22

(Continued on page 130)

Ignition Troubles Corrected

A Newly Perfected and Developed Device Which Will Be of Great Service to Motor Boatmen

EVERYONE knows that ignition plays a vitally important part in the operation of internal combustion engines. There are many engineers who champion the use of the magneto, and also many engineers who pin their faith to the battery system of ignition. Both types of these systems are designed to give excellent service, and if properly cared for give satisfaction up to a certain point.

All of us have suffered the annoyances incident to an engine failure caused by the spark plug failing to fire. Ordinarily this spark plug failure is caused from one of three conditions, broken porcelains, excess of oil in the combustion chamber; making oil-soaked plugs, or heavily carbonized electrodes.

During the war it was vitally important to reduce to the minimum engine failures in airplanes or motor vehicles. A very thorough study of ignition and carburetion and engine operation in general was made. Certain engineers engaged in study of the ignition problems developed some very important and interesting data. It was a well-established fact that both battery and magneto types of ignition would be in use; therefore, an auxiliary ignition unit had to be developed which would work equally well with either type of standard equipment ignition. It was realized that this auxiliary ignition unit must be thoroughly capable to overcome spark plug failures. This auxiliary ignition unit must be capable of meeting the varying conditions which would arise in the operation of the engine, it must be capable of adjustment while the engine is in motion. This is particularly necessary in the operation of a marine engine.

The experimental work in the development of this ignition auxiliary unit was taken to members of the Staff of the United States Government Bureau of Standards. These engineers developed and perfected this auxiliary ignition unit which ultimately became known as Shursparc. The old principle of introducing auxiliary gaps into the high-tension circuit of an ignition system is the basis of the principle used, but it is applied in an entirely unique way. In other words, this auxiliary ignition unit is introduced into the ignition system after the current has made its first spark at the distributor head of either type of ignition.

The quality of the spark needed to fire the gasoline mixture in a cold engine when the engine is started is different from that to be used when the engine is started, warmed up

(Continued on page 84)

A New Hacker 25-Footer

THE photograph below is that of the new 25-foot Runabout just recently brought out by the Hacker Boat Company of Detroit, Mich. It was designed by John L. Hacker along the same lines as the Adieu and Nick Nack, which have proven to be the most efficient boats of their type ever produced. Due to certain improvements originated by Mr. Hacker the same principles have been applied to the new boat, which has proven a wonderful performer beyond expectations.

The new boat is exactly 25 feet in length, and has a beam of 6 feet 2 inches. It is a solid mahogany job throughout and up to the minute in every detail. A cosy forward cockpit, allowing comfortable seating space for two passengers, is arranged forward of the motor. The motor is installed under flush hatches, allowing ample room all around the motor. The aft cockpit is arranged with two Bucket type seats forward, with space in between for another passenger in emergency, then an aft seat that will seat three very comfortably, making in reality a seven- to eight-passenger boat. The floors are all covered with linoleum and aluminum bound. All instruments are mounted on an instrument board, and controls are exactly on the same order as found in the higher class automobiles. The outfit is delivered completely equipped and ready for instant operation.

The power plant installed in this outfit is a Model D four-cylinder Scripps motor. This motor drives a 17 x 22 three-bladed Hyde propeller in the boat 1,560 turns, and develops a speed of over twenty-five miles. This outfit has been thoroughly tested under all conditions of seas, and has proven exceptionally dry and comfortable. There is absolutely no noticeable pounding in seats, and, as a whole, has exceeded even the expectations of the designer. This little boat can be turned at full speed in a 100-foot radius, and as a stunt boat is second to none. It has proven an exceptional outfit in every way, and the builders are so pleased with the outfit that they have decided to get production on this outfit which will make it possible to obtain an absolute high-class 25-foot boat as complete in every way as a high-class automobile with a very desirable speed at a very popular price.

A Hacker 25-footer with 40 h.p. Scripps motor which makes 25 miles an hour

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Winter Races at Los Angeles

A series of races extending through the winter season will be conducted by the Los Angeles Athletic Club's Motor Boat Racing Association. These are to extend from November to May 1922 and an invitation is extended to all motor boat enthusiasts to visit southern California and participate in these contests. Suitable prizes will be presented for all events and all boat owners willing to compete are invited to get in touch with the committee for the details. There are many fast and able boats in this vicinity and they will appreciate an opportunity to demonstrate their ability and at the same time show their hospitality to all visitors. They are the kind of boatsmen who may be beaten in competition but always come back for more.

Instruction Classes

The Patapsco River Power Squadron, Baltimore, Md., announces a new series of lectures on navigation to be held at the Maryland Yacht Club house. All boat owners and others interested are invited to attend. Secretary M. N. Price will be glad to give full particulars.

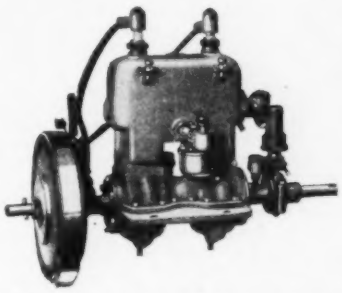
H. Palmer to Build Boats

The new firm, Palmer and Gardner, is established at Bridgeport, Conn., with the announced intention of building cruisers, and runaboats in various sizes and types. A suitable location has been secured in which the enterprise will be carried on.

Adjustable Tiller Quadrant

A new and useful invention has just been patented by Thomas Tvedt of Cherry Valley, Mass. The principal object of this device is to provide a means whereby the rudder and the quadrant may be readily adjusted into line with each other. In case of accident to the rudder or stock they can be readjusted into their correct relative positions without the necessity for hauling the vessel out of the water. Should an accident of this kind occur it is seldom in the neighborhood of repair facilities and the ease of effecting repairs by means of this adjustable quadrant will permit the boat to proceed. The fact that the rudder stock may have been bent does not necessarily mean that it is twisted and an adjustment will effect what practically amounts to a permanent repair. The ease of adjustments is such as to avoid the necessity for towing bills or other expensive repairs.

A new type patent muffler is being perfected which has several novel features and more will be said about it later.



The New 4-5 h.p. Evinrude inboard motor which will have many uses among the small boat enthusiasts who want more power than the portable outboard motor can supply

Efficient Ignition System

Circulars have been received describing the Philbrin types of ignition apparatus from which it is learned that the efficiency of these devices is very high. There are three independent systems consisting of: Two single spark systems either of which can be used for regular running and a high frequency system which is used for starting and emergency running. Flexibility of operation and great durability are secured by reason of the simplicity of the construction.

Piston Distributors Visit Factory

The Clark-Turner Piston Company of Los Angeles has entertained numerous distributors of their product. Walter Hodgkinson of New Haven made the trip to Los Angeles for the express purpose of inspecting the factory. R. W. Gould, another distributor, also called. Harold A. Duff, representative of the company, has attended numerous exhibitions in the west and reports splendid business.

New Oberdorfer Plant

A wonderful new plant just completed for the Oberdorfer Brass Company at Syracuse, New York, has been put into operation. This beautiful group of buildings affords this company tremendously enlarged facilities which have been made necessary by the growing business of the company in spite of the general business depression which has existed. The plant covers three acres of ground and all types of aluminum, brass, and bronze castings can be made. The product which appeals to the motor boat man is the bronze gear pump used extensively on many boats.

A bird's-eye view of the new plant of M. L. Oberdorfer Brass Company at Syracuse, New York

Caille Motor Wins Races

In the small open boat class in the Delaware River Races the launch Cornell, equipped with a 2-cylinder 8 h.p. Caille motor, was successful in winning a race of 32 miles in length. The tides on the day of the race were not favorable and in spite of this the distance was covered in 4 hours and 10 minutes.

A race for small boats equipped with outboard motors on Hubbard Lake, Mich., was won by A. Backus, driving a boat equipped with a Caille Liberty Drive Motor. The second boat to finish was equipped with Caille 5-Speed Motor.

Docs, the winner of a race meet to determine the undisputed champion of the popular 705 class on the Illinois River. Her owners, Doctors Van Sant and Whipple, drove her at the rate of 47 m.p.h. in the race, defeating Meteor III and Black Diamond

Defoe Boat Works Being Enlarged

The Defoe Boat and Motor Works, Bay City, Michigan, found it necessary to build a much larger small boat plant on their property in connection with the steel shipyard. When the new boat plant is completed it will have a floor space of about 42,000 sq. feet, exclusive of lumber sheds, small out-buildings, etc. These are all new buildings which have been erected in the last eighteen months and the plant is one of the best equipped and modern

(*Continued on page* 130)

How Much Should A Motor Boat Cost?

(*Continued from page* 51)

to introduce a new type it is sold at a price which will insure of many getting into service in order to promote future sales, but the costs of this exploitation are charged off to advertising and no profit is made. No one can continually produce anything costing a dollar and sell it for seventy-five cents and stay in business. Each line must carry itself and earn a profit.

And until the buying public learns to buy boats as they buy automobiles—standardized, built in quantity, all alike, yet reliable and attractive full value—you and I will pay more for our boating than we need to. If firms turning out automobiles had built cars the way boats are built, only the wealthy would now own them rather than their being within the reach of the average family. The manufacturing overhead on a Ford is so little that you and I spend that amount often on a good outfit of clothes, for instance. But the average buyer of a motor boat has until very recently refused to take a boat built like the other fellow's, although he has made no fuss about buying an auto that he couldn't distinguish from the other fellow's except by tying a piece of string on the steering wheel.

Even when the poor builder was lucky enough to have two men come along to his shop who wanted a 30-foot cruiser of the same design, one wanted plain finish while the other wanted fancy mahogany work. The latter was quite willing to pay the difference in the cost of the mahogany over the oak and cypress. Although the boat builder knew that it would cost more than the mere difference between the cost of the lumber, he could not make the prospective customer see it and not wanting to lose the order and figuring that he could get by financially by economizing in other ways he took the job, and in the end shouldered the cost of getting out the joinerwork in the more expensive wood. For he could not get the millwork or finishing done as quickly using two kinds of wood as in the case of one.

Other items where extra expense enters in are the changes from the plans and specifications upon which the builder figured the job. Every builder knows when he figures a job that other builders are competing for the work and he figures close. And the estimating department in every boat yard is never any too highly developed and costs of doing work are none too detailed and definite. Yet many a time after the builder has submitted his bid and is in line for the contract he is asked to just add two feet to the cabin and build in a locker with a door, of course, and shelf for hats and also just carry a little beading around the bulkheads for finish that the plans ought to show, but the draftsman forgot. Only small matters, don't take much material, not enough to talk about, slap it up in a couple of hours. The builder knows how long a man can work to do such jobs right, but the man can't pay any more; the builder knows what he'll say if he sees the work slapped up quick as he talked of, yet the contract is needed and he agrees to the slight changes asked for then and perhaps during construction. Did you ever ask your contractor to lengthen the kitchen a few feet, add a lobby with a door and make beveled paneling in the living room instead of plain paneling called for by the plans? Did you go where he told you to? What would an automobile manufacturer tell you if you asked him to put the driver's seat and wheel on the right instead of the left, just because you thought you'd like it better that way and if he would you'd buy the car?

After the builder has gone the limit to please, has he not often been the subject of some such conversation as this: Say, Bill, I've got you beaten. I've found a builder who'll build me a boat just like yours with 10 h.p. more and copper fastened for $——, and that's a couple of hundred less than you paid for your old tub; and I'll show you my wake next summer. And this is the fellow talking whom the boat builder thought he would get because he did so well by his friend. Whose fault? No, we are not roasting boat buyers, nor making the boat builder out to be cringing for business. The engine salesman has been up against something of the same condition. There has been and is so much competition to get the limited amount of business that goes round that one has to go the limit in figuring and angling for the order. Some boat builders are as independent as you could wish; but the big majority are in competition with many others for one particular contract and cannot afford to be too independent.

It is all because the business is unorganized. There is no organized effort to educate the public up to boating and all that it means. Only a handful of the boat and engine builders of the country are represented in the association, boating is not boosted in the newspapers where it should be made more of, and the boat and engine builders do not know each other, almost never get together, all of which would help to strengthen the trade, standardize practice and costs, and educate the general public to boats and boating. All these things have helped to improve the auto and they will do the same for the boat.

Did you ever get bids on a certain boat from the same plans and specifications? We have, often. The high bid is often double the low bid, often the high bid is by a small yard or builder but often by a large, well known builder. Often a big yard will bid low to get work in a dull season to hold their organization together. Often they will bid high enough to include a charge for their name and reputation and to keep the price of their product such that it will insure highest quality product and clientele. Actually, the only way to do when you get bids is to carefully study them on systematic lines, taking into consideration the various items that make up the price of any object, viz., cost of materials, cost of labor, overhead, general reputation, second-hand value, and market conditions.

So there's the cost problem. It is complex, few write much about it because there is little one can say in generalities, one needs to go into details and consider individual concerns in order to see the force of the cost question—but this cannot be done. It is not suggested at all that you nose into the affairs of a builder or engine manufacturer; the ordinary keen business man can gather an idea of many phases of the subject by a visit to a plant, inquiry among customers or friends will add more information, and there are consulting engineers and naval architects who can help in this if you will use their services.

The writer has given some thought to the cost of the boats included in our series of the past twelve months and, with the cooperation of some of the boat builders and engine companies, has estimated roughly the cost of these boats. These prices follow. Please note that every builder in the country was not consulted; many will quote higher than our highest, many lower than our lowest. We hold no brief for any one; these figures are simply approximate prices worked out by various builders to give you an idea as to cost of these boats built by a regular builder. They do not include engine in any case.

Cost of Boats						*Cost of Engines, Including Installation in Boat, but not Transportation*	
Name of Boat	*Published in MoToR BoatinG 1921*	*Cost of Complete Knock-Down Frame*	*Cost of Boat Complete Except Engine*	*Additional Cost of Copper Fastenings over Galvanized*	*Additional Cost of Mahogany Finish*	*Horse Power of Engine*	*Cost of Motor Completely Installed*
Chum	January	$ 200–$ 500	$ 500–$1000	$ 35	$ 40	3– 8	$ 150– $500
Nomad	February	500– 1000	2500– 3500	75	150	18–30	700– 2500
Porpoise	March	250– 500	1000– 2000	35	50	5–12	500– 1500
Shrimp	April	275– 500	1000– 2000	40	40	10–25	500– 2000
Dolphin	May	500– 900	3000– 3600	75	150	18–30	700– 2500
Nautilus	June	650– 1500	4000– 7000	150	300	20–30	1000– 2500
Penguin	July	375– 800	2000– 3000	100	125	5–12	500– 1500
Whale	August	250– 475	1500– 2200	45	60	8–15	500– 1200
Sea Gull	September	1400– 2500	4500– 7500	300	300	15–25	500– 2500
Tarpon	October	425– 1000	2500– 3500	70	95	15–20	500– 2500
Alligator	November	425– 1000	2000– 3000	75	125	10–20	500– 2000
Mud Turtle	December	450– 1100	2500– 3500	75	125	8–18	500– 1000

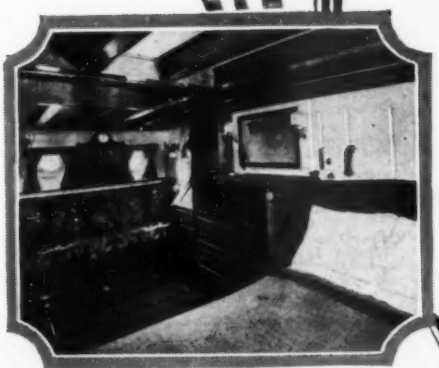
A Dream of Adventure Come True—

ONCE in a blue moon a dream comes true. For years Albert Y. Gowen, Jr., of Chicago dreamed of going around the world in a boat less than a hundred feet long. It was to be more than a pleasure cruise. He wished to ply uncharted waters—to bring back in specimen and picture a real contribution to America's knowledge of the manners and customs of strangely peopled places.

And now *Speejacks*, the 98-foot express cruiser, built for Mr. Gowen by the Consolidated Shipbuilding Corporation of New York, and powered with two 250 h. p. Winton engines, is in the South Seas on the first leg of her daring 50,000-mile cruise.

In the face of adventures that await them, nothing has been spared to assure the success of the expedition. The ship is equipped to endure the vicissitudes of the Seven Seas. Sailboat, tender and power boat are ready in case of distress. Machine guns guard against possible encounter with hostile natives. Teakwood decks and teakwood exterior woodwork provide sure resistance to any climate. And—naturally—*Speejacks*, from stem to stern, is

Valsparred, of course.



Photos © Rosenfeld, N. Y.

VALENTINE & COMPANY

Largest Manufacturers of High-Grade Varnishes in the World—Established 1832

New York Chicago Boston Toronto London Paris Amsterdam

W. P. FULLER & CO., Pacific Coast

VALENTINE'S VALSPAR

The Varnish That Won't Turn White

VALENTINE & COMPANY, 456 Fourth Ave., N. Y.

Special Offer

For your dealer's name and 15c in stamps, we will send you a 35c sample can of Valspar or Valspar Varnish Stain—enough to finish several square feet of surface. Fill out coupon.

Dealer's Name.....

Your Name.....

Your Address.....

M. B. 12-21

Advertising Index will be found on page 138

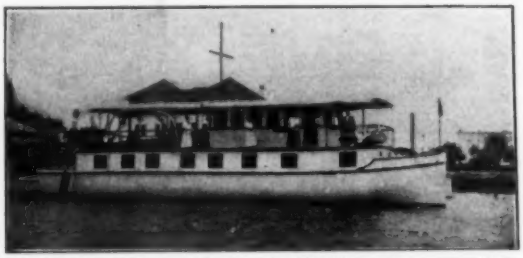
TAMS, LEMOINE & CRANE

NAVAL ARCHITECTS AND YACHT BROKERS

Telephone 4510 John

52 Pine Street New York City

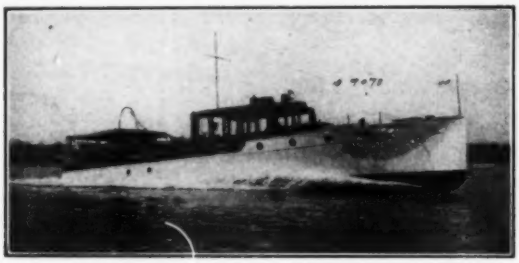
Offer for sale the following yachts, some of which are available for charter



No. 1902—Sale or Charter—In Florida. Most commodious houseboat of her length available; 64 ft. x 17 ft. x 6 in. x 3 ft. 2 in. draft.

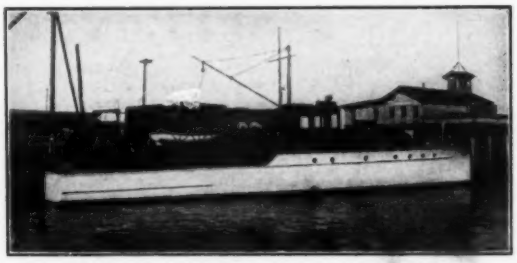
No. 1927—Sale—Charter—Immediate delivery. Most attractive twin screw houseboat 85 ft. x 19 ft. x 3 ft. draft. Built 1919, 5 staterooms, 3 bathrooms, deck saloon, etc.

No. 7474—Sale—Brand new fast cruiser; 2-6 cylinder Sterling motors. Speed 21½ miles. All modern conveniences.

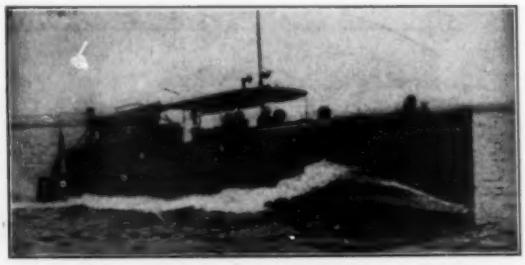


No. 9078—Sale or Charter—Fast 48 ft. express cruiser in commission. Immediate delivery—2 new 6 cylinder Van Blerck motors. Good accommodations. Thoroughly overhauled last year in all departments.

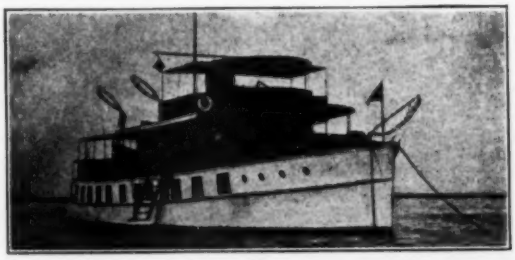
No. 8102—Sale—Charter—Most desirable raised deck cruiser available. Practically new. 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles. Electric light, hot water, heat and refrigerating plant.



No. 9075—For Sale—Desirable raised deck cruiser 70 ft. x 11 ft. x 4 ft. Good accommodations. Speed 23 miles.



No. 8978—For Sale—Raised deck semi-day cruiser. 200 H.P. Sterling motor. Speed 20 miles per hour. In the very best of condition. Price reasonable. Full particulars and plans from Tams, Lemoine & Crane, 52 Pine Street, New York.



No. 1926—Sale—Charter 98—New houseboat; 6 staterooms, 3 bathrooms, dining saloon, sitting room; electric lighted and hot water heat.

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THE MOTOR BOATING MARKET PLACE

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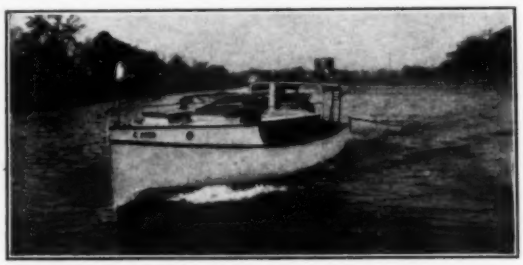
Cut one inch deep, one column wide..... $ 5
Cut 1¼ inches deep, 1⅝ column wide..... $10
Cut 2¼ inches deep, three columns wide..... $20

Terms: Cash with order.

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.

No. 547—An unusual opportunity is offered to secure this most modern Gentleman's Express Cruiser at attractive price for immediate sale. 54 feet long and equipped with 200 H.P. Van Blerck motor; speed up to 18 miles per hour. Whole outfit like new and must be seen to be appreciated. Inspectable New York City. No better craft available. Quick action will secure bargain. Full details from Simon Fisch, Yacht Broker, 185 Madison Avenue, New York City. Telephone Vanderbilt 6717.



Complete 31 ft. cruiser, sleeps 4, speed 8-12 miles, new in 1916. 40 H.P. 4 cyl. engine, burns kerosene. Toilet, electric lights and running water. Will sell for $1,250. Everything in perfect condition. W. B. Durkee, 62 Playstead Rd., Newton, Mass.

Engine bargains in Sterlings, Doman, Kermath, Erd and others; also rebuilt second hand motor and sail boats. Send for list. Everett Hunter Boat Co., Dept. E, McHenry, Ill.

For Sale Cheap—Brand new Type A-12 Fiat and V-5 Isotta engines. Brady's Warehouse, 554 West 58th St., N. Y. C.

Position Wanted—Naval architect, 20 years' experience, desires position with shipyard, or yacht building yard; or designing and yacht brokerage firm. Address Naval Architect, Room 602, 136 S. 4th St., Philadelphia, Pa.

For Sale: Attractive Cabin Cruiser—36' x 9' 3" x 3 ft. White cedar hull, oak frame, mahogany cabin, toilet, galley, ice-box. 24 H.P. heavy duty Sterling engine. Could possibly accept reasonable terms from responsible party. Box 68, MoToR BoatinG.

For Sale—Red Wing motor, good condition, $200. 40 H.P. Capt. H. Watson, 3707 Third St., San Diego, Calif.

Kermath 12 H.P. motor, separate engine plant without reverse gear, fitted with Bosch magneto and impulse coupling, absolutely first class condition, overhauled, guaranteed at $250.00. Kermath Mfg. Co., Detroit, Mich.

For Sale—One three-cylinder Gray 36 H.P. motor with Paragon reverse gear, 9 ft. shaft, 3 blade propeller 24 x 24, coils and magneto. L. C. Edelblut, Augusta, Ga.

FOR SALE OR CHARTER: Beautiful 60 ft. twin screw yacht, completely reappointed and overhauled. Solid mahogany trim thruout, two staterooms, with toilets, two motor dories, galley, two separate lounging decks, separate crew quarters. A splendid opportunity for a reasonable charter. For further information apply to Box 66, MoToR BoatinG.

Wanted—Kermath motors, old models. Will give good allowances on old type Kermath motors as part payment on new Kermath engines. It will pay you to get our proposition and have a brand new engine with everything up to date. There is a fine market for used Kermaths at prices lower than that of new engines. Kermath Mfg. Co., Detroit, Mich.

Auto Motor Supplies—Buick—Michigan—Stoddard Dayton—Cadillac—Overland—E.M.F. Continental and Buda Motors, all types $50 each and up. Special high tension 2 and 4 cylinder Magnetos $9.50 each. Electric and Gas Head Lamps—Coils—Carburetors—Air Compressors—Generators—Starters, etc. Write for late catalogue. Address Motor Sales Dep't. B, West End, Pittsburgh, Pa.

Wanted—28 or 30 ft. raised deck cruiser. Send photo, give full description of boat, outfit, motor, age, condition, cabin head room, builder's name, price, etc. Must be on some port on Great Lakes. Chas. F. Smith, P. O. Box 258, Santa Ana, Calif.

Wanted—Cruiser, between 50 ft. and 80 ft. long. Not less than 12 ft. beam. Not more than 4 ft. 6 in. draft, twin screw preferred. A strictly up-to-date cruiser desired. I will allow a fair price for this cruiser in exchange for my island home in the St. Lawrence River. My place is fully equipped with every convenience and luxury. Furnished most comfortably and has fifteen rooms, five baths, electric light and water plants. Boats and power craft. Location ideal, near golf club and yacht club. Will take mortgage back for entire difference between cost of boat and price of place. Property will be valued at cash selling price and boat will only be considered on same basis. Address Island Home, Lock Box 5, City Club, 55 West 44th St., New York City.

I have a few pair of Bausch & Lomb 6 x 30 power, prism binoculars and will sell them for about one-half of the regular price—this is a wonderful opportunity for yachtsmen to get a good pair of glasses. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

For Sale: 1. 2KW Carlisle & Finch direct connected lighting plant, and 1, 5 KW Winton direct connected plant; also 1-18 in. and 1-14 in. Rushmore searchlight and one 9 in. all brass-stand deck type yacht searchlight, and a few 150 lb. mushroom anchor. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

For Sale—Raised Deck Cruiser—31.9' x 9' beam, 2-cylinder, 4-cycle Ralaco motor, electric lights, spring bunks, running water, dink, full equipment. Can be seen in N. Y. C. Price $1500. Address Box M, MoToR BoatinG.

All Sizes Rebuilt Marine engines from one to 300 H.P. 4 cyl. 4 cycle GLOBE 10 x 14", reverse gear, magneto, 48" propeller, $6,000.00. Pair STANDARD 300 H.P. 12 x 14" reversible, cost $25,000.00 each, price $4,000 each. Many other large and small four cycle and two cycle engines, for work boats, yacht, cruiser or tender. Write for list.

Hamilton Marine Engine Exchange 440 Fifty-Second St. Brooklyn, New York

NEW LOWER FALL PRICES

You can now purchase our rebuilt and guaranteed engines at a fraction of their value. It will pay you to consider the bargains we are offering:

Regal	2	H.P. Inboard unit.
Gray	4½	H.P. Model R complete.
Ferro	8	H.P. Two cyl. unit complete
Sterling	10	H.P. Unit power plant.
Frisbie	10	H.P. Two cyl. unit.
Gray	12	H.P. Model T, 1 cyl. motor.
Gray	14	H.P. Model T, 2 cyl. motor.
Kermath	16	H.P. Unit power plant.
Scripps	20	H.P. Model H, unit motor.
Sterling	25	H.P. Model B unit motor.
Doman	30	H.P. Unit power plant.
Sterling	45	H.P. Model B unit motor.
Scripps	50	H.P. Four cyl. unit plant.
Standard	100	H.P. Six cyl. power plant.

This is only a partial list. Let us know your wants and send for complete list and prices.

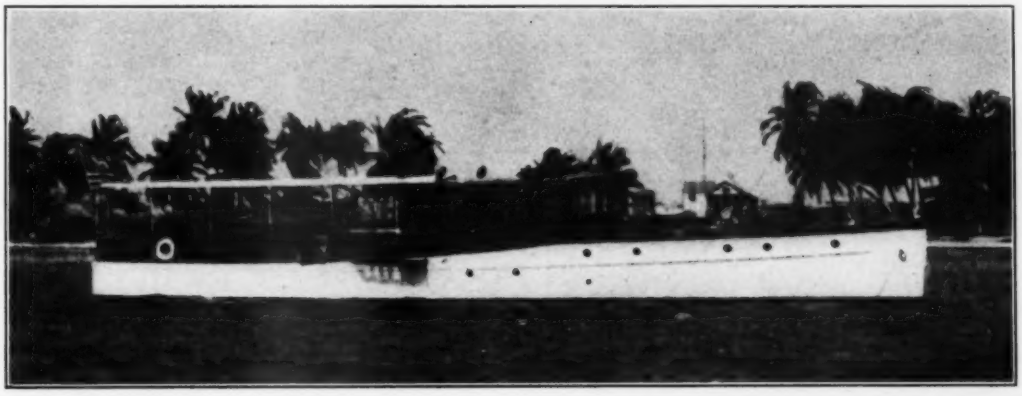
We are authorized distributors of:

STERLING SCRIPPS KERMATH
FRISBIE UNIVERSAL
EVINRUDE HYDE PROPELLERS JOES REVERSE GEARS

We not only stock these motors but carry large assortment of parts. Marine equipment of all kinds, propellers, reverse gears, etc.

W. L. MASTERS & CO., 231 N. State St., Chicago, Illinois

Advertising Index will be found on page 138



L'Apache—For Sale or Charter

ONE of the finest and most celebrated motor yachts afloat. L'Apache was built at the Seabury yards and embodies the best of everything in design, finish and equipment.

Length 72 ft. Beam 12 ft. Draft 3 ft. 6 in.

Speed 19 miles per hour

Oak keel, frames and floors. White pine decks. Double cedar planking. All other woodwork, hand rails, etc., of matched teak. Keel sheathed with copper with one inch oak strip. Watertight bulkheads.

Equipped with two 7″ x 8″ six cylinder Speedway motors. Copper fuel tanks, 700 gallons capacity. Copper water tanks, 200 gallons capacity. Deck pump. Auxiliary electric lighting plant.

Hardware fittings of Monel metal. Dining Saloon finished in teak. Finish of staterooms, toilet and bath room, mahogany, white enameled, with mahogany trim. Ceiling paneled. Hair filled cushions throughout, covered with best grade leather. Have rearranged bath room and put in ice box, sink, etc. Cedar dinghy 12 feet long with portable motor.

L'Apache is in the best of condition. Has been in charge of the same captain since the day it left the Seabury yard. Sale price includes everything ready for cruising, complete furnishings, etc., except linen and silverware.

Price $40,000. Charter $150.00 a day. (Minimum charter 10 days.)

Inquire of your own broker, or write

J. A. ALLISON **Miami Beach, Florida**

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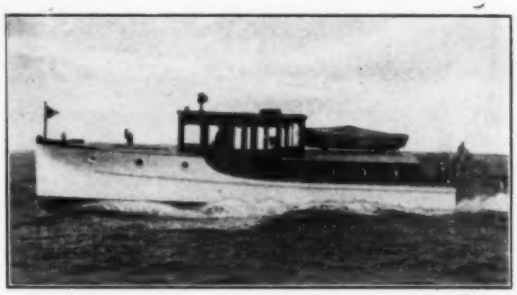
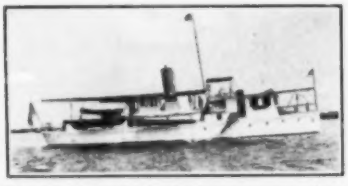
IDEAL CRUISER for Florida. No more attractive boat available. Up-to-date in every respect and in new condition. Built by the New York Yacht Launch & Engine Co., and of the best construction. Interior finish American Mahogany. Leading Yacht builders, using same interior design, which cannot be improved upon for comfort and ventilation. Coppered screened throughout. Novel ventilating device, giving thorough ventilation without permitting rain or spray to enter. Specifications: 55 ft. x 13 ft. 6 in. x 3 ft. 4 in. 6 cylinder 50-54 H.P. Standard engine, ¾ K.W. Delco Light and Water System, 250 Amp. Searchlight and power tender. Speed 11-12 miles on 5½ to 6 gallons of gas. Sleeping accommodations for 12 persons. Price 40% to 50% less than boat can be duplicated for. Can be put in commission in week's time. Guaranteed in every respect to be as represented. Why pay the 40% to 50% more for something no better, with the chance of it not being as good? Inspectable Wilmington, Delaware. C. M. Beadenkopf, 14th and Walnut Sts., Wilmington, Del.



For Sale Cheap—Miss Grosse Pointe, champion long distance cruiser, now at Miami, Florida. Won championship of Inter-Lake Yachting Association in 1919. Won long distance race from Detroit River Yachting Association in 1917. Won Bang and Go-Back race in 1918. Championship long distance race from Bob-Lo Island to Put-in-Bay. Won long distance race from Bob-Lo Island to Rocky River. Won cup from D. Y. C. to Rushmire in 1919. New Peerless engine, 50 horse power, cruising speed 12 miles. Length 45 ft, beam 11 ft, head room 6 ft. 6 in. R. Geo. Marsh, 106 Atwater St., E., Detroit, Mich.



No. 8173—For Sale—Twin-screw steam houseboat 80 ft. x 18 ft. x 3 ft. 6 in. Four single staterooms and bathrooms. Sleeps seven. Hot and cold running water. Boiler retubed 1920, also engine overhauled. Underbody coppered to waterline. Now hauled out, and inspectable Florida. Henry J. Gielow, 25 W. 43rd Street, New York City.

No. 2076 — For Sale — 41 ft. bridge deck cruiser, delivered new July, 1921, since kept in perfect condition. 9 ft. 7 in. beam. Galley and main cabin, with two upper and two lower berths, under raised deck forward. Engine room with berth for paid hand under very roomy bridge deck. Good double stateroom with toilet room adjoining aft. Very desirable for use in Southern waters or on New England Coast. John G. Alden, 148 State St., Boston, Mass.

No. 324—For Sale—68 ft. cruising power yacht. Brigantine rigged. 13 ft. 6 in. beam 5 ft. draft. Two double staterooms, commodious dining saloon, 8 cyl. Sterling motor. Cruising speed 13 miles. Independent electric plant. Hull received exceptional care and is in very good condition. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

HOUSEBOATS FOR SALE AND CHARTER

E. T. Pepper, Ft. Myers, Fla.

For Sale—98 ft. x 17 ft. Yacht, Twin Screw. 2-50 H.P. Murry & Tregurtha engine, electric lights, hot water plant for heat. Boat good condition, mahogany house. Price $6,000. Address S. Irwin Austin, 3008 E. Monument St., Baltimore, Md.

FREE Illustrated Literatures. Outboards, New and Rebuilt Engines. Universal Joints, Pumps, Clutches, Gears, Aerials, Hyde's, Gordon Reversible Propellers, etc. Canadian Boat & Engine Exchange, Toronto.

TRIMOUNT WHISTLE BLOWER OUTFITS

Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.

Made in 3 sizes.

TRIMOUNT ROTARY HAND BILGE PUMPS

All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.

Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., E. Dedham, Mass.)

Want and For Sale

20 and 24 ft. power dorys. 20 ft. speed, 28, 25, 27 and 32 ft. cruisers for Florida waters. Thos. Fleming Day, Inc., 412 8th Ave., New York.

I have a brand new 34 x 9 x 3 Bridge Deck Cruiser, Toilet and Cabin for four forward, Motor under bridge deck, aft cabin for two, toilet and galley aft, that I would trade for a 25-foot day cruiser and cash. Full particulars and photos exchanged. "Yachtsman," 309 E. 37th St., Savannah, Ga.

WINTER PRICES ON MARINE MOTORS

A few of our Rebuilt Bargains

Arrow	1 cylinder	2 H.P.	$40.00
Scrippa	2 cylinder	8 H.P.	125.00
Kermath	4 cylinder	12 H.P.	175.00
Regal	4 cylinder	20 H.P.	250.00
Red Wing	4 cylinder	16 H.P.	325.00
*Caille (aristocrat)	4 cylinder	14 H.P.	350.00
Gray Model "D"	4 cylinder	24 H.P.	350.00
Van Blerck C	4 cylinder	50 H.P.	350.00
*Sterling E	4 cylinder	25 H.P.	550.00
*Van Blerck J	4 cylinder	100 H.P.	850.00
*Van Blerck E	8 cylinder	200 H.P.	1200.00
*Sterling F	6 cylinder	150 H.P.	1500.00

* Equipped with electric starter and generator.

Let us send you our complete list and specific details on any particular motor you are interested in. Builders of the Belle Isle "Bear Cat."

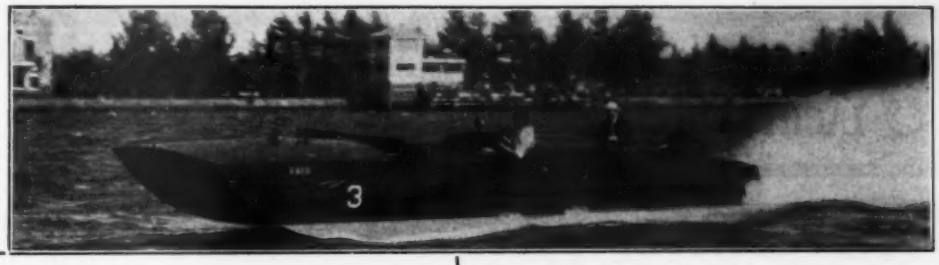
BELLE ISLE BOAT & ENGINE COMPANY
Detroit, Michigan

For Sale—Eight cylinder 200 H.P. Model F Sterling engine. Guaranteed good working order. Complete, including self-starter and generator. One thousand dollars cash. Hall-Scott Motor Company, Buffalo, New York.

One cyl., two cycle	
2HP Detroit	$25.00
3HP Ferro	35.00
4HP Northwestern	55.00
5HP American	60.00
6HP Caille	65.00
8HP Fairbanks	85.00
Two cyl., two cycle	
7HP Eagle	75.00
10HP Racine	65.00
12HP Gray	125.00
15HP Emerson	115.00
20HP Gray	175.00
Two cycle	
18HP Vim 3 cyl	125.00
20HP Roberts 4 cyl	155.00
40HP Roberts 4 cyl	275.00
60HP Roberts 6 cyl	315.00
Four cycle	
3HP Simplicity 1 cyl	45.00
6HP Perfection 2 cyl	55.00
12HP Kermath tractor motor (new) 4 cyl	145.00
12HP Campbell 2 cyl	135.00
16HP Dunn 4 cyl	145.00
100HP Hall-Scott 4 cyl. (new)	350.00
300HP Curtiss 8 cyl	525.00
45HP Buffalo 4 cyl. 7x9 with gear	850.00

BADGER MOTOR CO.
Milwaukee, Wis.

Advertising Index will be found on page 138



Orlo II at a speed of 47 miles per hour

GEORGE LEARY, JR
17 STATE STREET
NEW YORK

November 15, 1921

Charles F. Chapman, Esq.,
119 West 40th Street,
New York City.

Dear Chap:-

It is with deep regret that I must inform you that, by my doctor's orders, I will not be able to participate in any motor boat racing for the coming year. It is rather tough as I've got it in my blood, but the last accident at Buffalo brought my health to such a point where the doctors decided if I ever wanted to race again, I would have to give it up now and rest for at least a year. I had hopes of racing ORLO II, besides building a new boat for the races at Miami this coming March but now, that is all off the slate.

To my mind, the best idea is to have class motor boat racing, limit the size of your boats and the size of your motor so there is no getting around it. I have stayed awake night after night figuring how to beat the other fellow and now, I'd like a bit of fun just going into it and racing a boat against somebody, of equal speed and everything else and have the winning of the race depend on good driving.

John Hacker told me that one of the Cleveland Yacht Clubs are going to have a class of, I think, 25 foot runabouts which would make in the neighborhood of 30 to 35 miles an hour. When there are seven or eight of that type at the starting line, there ought to be a lot of fun.

I hope that by the time I get back in the racing game, you will have races like that near New York. In fact, if you think I could start the ball rolling by offering a cup, I would like to talk the matter over with you.

Yours very truly,
George Leary Jr

GLJr/MK

ORLO II *for* SALE

Orlo II is one of the finest and fastest motor boats ever built—a 35-foot Sea Sled that broke three world's records at the Fisher-Allison Races at Miami in 1921.

Official speed 47 miles per hour certified to by the American Power-Boat Association.

Carrying capacity at high speed.....20 persons.

Safe, Seaworthy and Dry.

Two 200 h.p. 6-cylinder Sterling Motors.

Fastest, all around, seagoing boat in the world.

(Note: My other Sea Sled Orlo III will not be in commission in 1922.)

An excellent boat for both northern and southern use.

Built for the 1921 Fisher-Allison Race. Holds fastest speed record for boat powered with marine motors with exception of my other boat Orlo III.

Orlo II can be seen in New York City. She is in excellent condition and ready to go into commission.

***For full particulars apply to* GEORGE LEARY, Jr., 17 State Street, New York, N. Y.**

or Laurence P. Pleasants, Yacht Broker, Sag Harbor, Long Island

Orlo II carrying 29 men

Test With Thickness Gauge

(*Continued from page* 40)

should be fitted to prevent turning and a couple of set screws placed on the quarter and slightly sunk into the shaft will prevent coupling from pulling off when backing. Where a really first class job is wanted, after the coupling is on the shaft, keyed, and set screws tightened, it should then go back into the lathe and have a light cut taken off the face.

If in doubt as to the accuracy of couplings, test out with thickness gauge as above, then rotate one-half coupling a quarter or half turn and test out again; if they face up the same as before, they may be considered accurate, but if a tight or open place develops where it was not before, then the fault is in the coupling. Test each half by rotating and testing one-half at a time.

Thickness gauges which are a number of thin metal leaves or blades with the thickness in thousandths on each blade can be bought at any tool supply store, and will be found convenient for this work although not absolutely necessary as any thin metal strip of even thickness and about ½ inch wide can be used.

Saginaw, Mich. E. H. C.

An Interesting Handicap Cruiser Race

(*Continued from page* 24)

a copy of U. S. Lake Survey Chart No. 75 of Lake Michigan; an Azimuth Table which is published in Scate's Cruising Book as well as in the Lake Survey Bulletin. For convenience he should also have the equivalent of a pair of dividers, parallel ruler or protractor and right-angle triangle.

Caution:—It will be necessary for each skipper to know the correction to apply to his compass to make allowance for variation and deviation.

All contestants will head for the Hyde Park crib immediately after crossing the starting line. Time should be compared with the official timer before the start.

The starting line will be the same as the finishing line and will be indicated by committee flag on Casino Pier and another flag on stake boat at right angles to flag on pier.

A base line running NNW-SSE was laid out on U. S. Lake Survey Chart No. 75 on which were plotted seventeen triangular courses using the compass points within this arc. It will be noted this system is capable of indefinite expansion as to number of courses that can be assigned. To permit the Regatta Committee properly to do its work entries for the contest closed 48 hours before the date of the contest. Contestants who were given courses to the north of east were required to turn to the right after sailing the first leg and contestants whose courses were south of east were required to turn to the left. The time of departure of each contestant was based on the time of the slowest boat entered (not shown in the summary as the slowest boat did not start) so that theoretically all contestants would finish approximately about the same time. The first boat was scheduled to cross the line at 2 p. m. and the last one at 2:36 p. m.

A sample of the sealed orders given to each contestant follows:

Sail direct to Hyde Park Crib; from crib you will sail E.N.E., a distance of 5 miles; thence you will execute a true right angle turn to the right of the course last sailed and sail thence a distance of 4⅛ miles; you will thence turn and lay a direct course to the Hyde Park Crib; from the crib you will sail directly to and across the finish line (same as starting line), thus concluding the contest.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of MoToR BoatinG, published monthly at New York, N. Y., for October 1, 1921. State of New York, County of New York, ss.: Before me, a Notary Public, in and for the State and county aforesaid, personally appeared C. F. Chapman, who, having been duly sworn according to law, deposes and says that he is the Business Manager of MoToR BoatinG, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, International Magazine Co., 119 West 40th St., New York, N. Y.; editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; managing editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; business manager, C. F. Chapman, 119 West 40th St., New York, N. Y.

2. That the owners are: International Magazine Co., 119 West 40th St., New York, N. Y. Stockholders: W. R. Hearst, 137 Riverside Drive, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: Columbia Trust Company, 60 Broadway, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.; W. R. Hearst, 137 Riverside Drive, New York, N. Y.; Arthur Brisbane, 238 William St., New York, N. Y.; Lina Strauss, 27 West 72nd St., New York, N. Y.; George J. Gould, 165 Broadway, New York, N. Y.; E. H. Gary, 856 Fifth Ave., New York, N. Y.; Samuel Untermyer, 37 Wall St., New York, N. Y.; George W. Perkins Estate, 71 Broadway, New York, N. Y.; James Speyer, 1038 Fifth Ave., New York, N. Y.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

C. F. CHAPMAN, Business Manager.

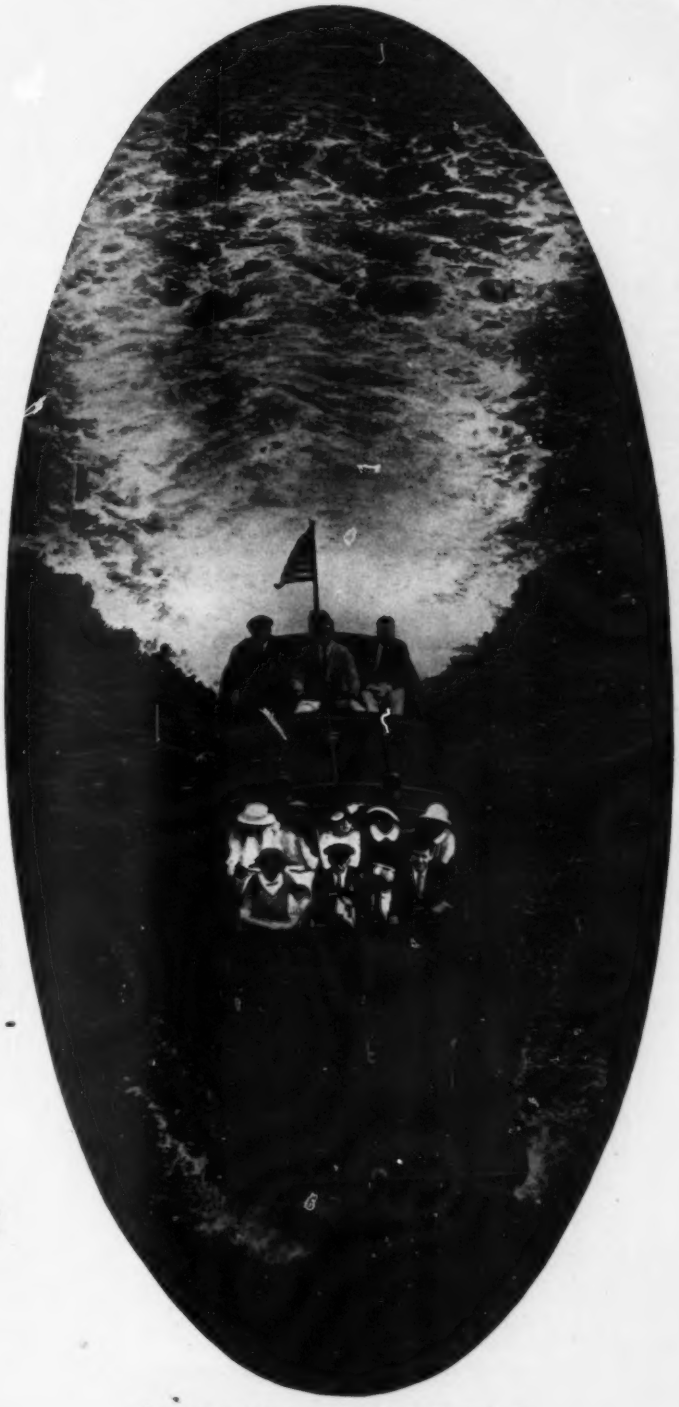
Sworn to and subscribed before me this 26th day of September, 1921.

(Seal) K. J. MOORE,
Notary Public, New York County.
Register No. 3144.
(My commission expires March 30, 1923.)

SEA SLED and the HALL-SCOTT

Trade Mark Reg. U.S. Pat. Off.

Marathon, 46-47 Miles Per Hour



"Marathon" is a 30-footer, designed and built by the Sea Sled Co. for Mr. Henry B. Plant, of New London, who uses her as a tender for his sailing yacht, "Spartan," and for fast ferry service to New York and Long Island.

The outstanding advantages of Marathon are the large passenger capacity, the sustained high speed and the dryness, safety and all-around riding comfort in a choppy sea.

Boats of the Marathon type are ideal for fast tenders or pleasure runabouts when they combine the peculiar advantages of the Sea Sled with the power and dependability of Hall-Scott motors.

A pair of 200 H.P. six-cylinder Hall-Scott marine motors drives Marathon up to 47 miles per hour with characteristic Hall-Scott reliability and satisfaction.

Mr. Plant has made numerous runs between New London and Glen Cove, Long Island—approximately 80 nautical miles,—carrying seven or eight passengers per trip without crowding. The run requires about two hours and twenty minutes, running steadily at 31 knots, the powerful motors turning just a little more than idling speed to maintain this remarkable cruising speed. They will operate almost indefinitely and without any trouble whatsoever when running this way.

Marathon is just another one of the conspicuously successful boats powered with Hall-Scott marine motors.

Two Sizes Only
4 cyl. 125 H.P. Weight 1100 lbs.
6 cyl. 200 H.P. Weight 1300 lbs.

Let us send you further data. Write today.

Single and twin screw plants in stock at

HALL-SCOTT MOTOR CAR COMPANY, Inc.

Eastern Sales and Service Branch, 266 Main Street, Buffalo, N. Y.

Factory—Berkeley, Calif.

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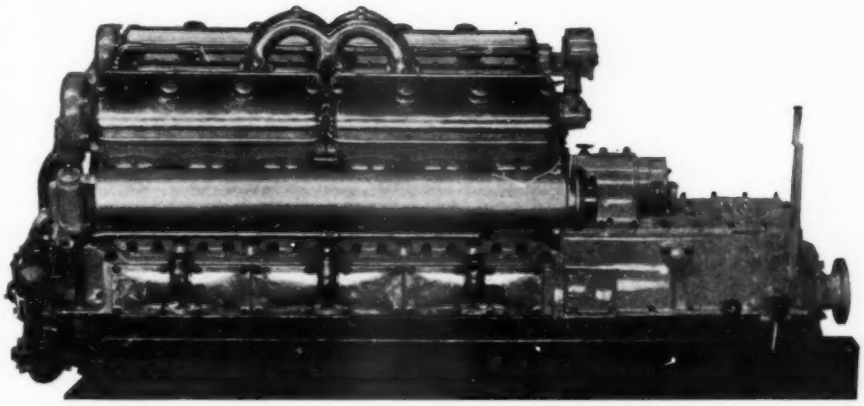

Twelve cylinder, Vee type 400 H.P. at 1400 R.P.M. Bore 5½", Stroke 7½". Weight 4400 pounds.

Built for the man who can afford the best

The Finest Marine Power Plants Money Can Buy

ALLISON MOTORS

THE Allison Twelve is the result of three years of conscientious effort to produce the highest type of marine motor possible to build. Unlimited engineering experience and unlimited experimental work were devoted to its development. It was not announced until we were satisfied that it was beyond improvement.

This, we believe, is the first high-speed, high-power gasoline motor that offers a thoroughly satisfactory substitute for the steam power plant in yachts up to 120 feet. It offers the same utter reliability, the same durability, flexibility and speed without the bulk or complication of the steam plant. Perfect balance, ample power and, above all, continuous performance.

The Allison Motor is built for those who want only the very best obtainable in boats and motors. The price of $25,000 is amply warranted by the cost of production and the care taken in its construction.

The buyer of an Allison Motor therefore may rest assured that he has not only the best marine motor now built, but also the best marine motor that can be built with the present degree of automotive engineering knowledge.

It is a pleasure to send the complete specifications upon request from those interested in a motor of this character.

Demonstrating the reliability of the Allison Motor, Mr. Carl Fisher's Aye Aye Sir ran the three 50-mile heats of the Fisher-Allison race and the 50 mile free for all race at Buffalo with the engine compartment sealed. Without breaking the seals the boat was then driven from Buffalo to Detroit. At the Detroit Regatta, Aye Aye Sir also ran the three 50-mile heats of the Wood-Fisher race with engine compartment sealed. This motor performance has never been equalled.

ALLISON ENGINEERING COMPANY

Indianapolis Indiana

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Cruising Under the Shadow of Kletsa

(*Continued from page 9*)

the numerous creeks, trolling for trout and salmon, and sometimes climbing the mountain sides in search of deer, bear or grouse.

One evening we set sail from our base of supplies, after a severe windstorm, and travelling until midnight, on the crest of the dying waves, drew up by the light of the moon upon the bank of a favorite fishing stream. After a fire had been lighted one of the crew who was more awake than the others went ashore and delighted himself in playing the phonograph which he held in his arms as he pranced up and down the beach. Early in the morning he arose and went off after the elusive wapiti, but returned before noon fatigued without sight or wisdom of that for which he sought.

Adventures, chiefly of the tame variety, were many, but I shall never forget two of the worst storms I have ever seen on inland waters. It had been raining for several days and the fish and game had been particularly scarce. We had betaken ourselves to our camp on an island miles below the wilder parts of the lake, and had engrossed ourselves in books, magazines and our various occupations. Gibson, a native of the auld cawntrie whom we employed as a sort of go-between in all things we none of us liked to do, an elderly little man, near-sighted, but with no other vice of which we knew, had gone down the trail to our rustic floating dock to see if everything was secure for the night. The only other male member in camp besides the author was a young man who had come up from Victoria for a few days' vacation, and both of us were in the act of changing our clothes when the first gust of wind struck the lake. Not only a gust, but a hurricane it seemed, and shortly after it commenced we heard a faint wailing emanating from the water's edge. Our first supposition was that this cry came from someone who had been caught by the squall somewheres on the lake, and who was perhaps drowning; then gathering our senses we realized it could come from no one save Gibson, who might at that moment be adrift at the mercy of the waves. The next twenty-five minutes were the liveliest twenty-five minutes I had spent for many a year, for on reaching the water's edge we had found that the lake, washed into foam, had lifted almost bodily our landing, with our little vessel attached to it and had not only taken it out to sea, but in addition had swept it against a perilous reef of rocks a few yards distant from the island. It was with great difficulty that we managed to lasso a rope to it and make it fast until the gale had spent itself; while the faithful Gibson extricated himself from beneath the boat and the logs on the pier, to which he had clung after the first gust had passed by.

One afternoon a youngster from California who with his family was visiting some people across the lake from us, set forth in a sailing canoe, and for several hours progressed as smoothly as he had anticipated. But a squall descended from the mountains and in a whiff the boat was under water. The young boy had sense enough to keep hold of the overturned boat until we reached him, cramming on all the speed we could gather from our NL 1. Two other boats appeared shortly afterwards, and all wished to claim the honor of saving a life, when in reality the boy needed medical attention a great deal more than honor.

Occasionally when the rain descended, not as rain descends in the east, but in sheets such as it descends on the Pacific slope, for days at a time, the lake would rise as much as three and four feet in a night. We were camped one blustering night at the outlet of a mountain stream. Fortunately we had secured the bow of our boat to some shrubs on the bank of the stream before we turned in. Mrs. Vanderbilt and the author were beneath the awning of the launch, while the four others in the party slept two under an automobile tent and two under a lean-to. The latter kept up continuously a brilliant fire, and often during the night we could see from our observation post on the water's edge the glistening eyes of some owner of the backwoods. Shortly after midnight the storm increased, so much so that the couple under the automobile tent were soon flooded out, and were obliged to double up with us in a sitting posture for the rest of the night. Before daybreak the waters had risen to such a height that the launch was tugging frantically at its feeble knot, and at six o'clock the waters had risen two and a half feet; or over a foot every two hours.

High water always endangered any night trips and we did our best to stay ashore after the sun went down until the lake had resumed its normal size once more. We had a nasty experience in one of these spells after dark. The author and the ever-faithful Gibson were returning from the village of Alberni one evening with the necessary fresh meats for the coming period, and were experiencing some difficulty with poor gasoline. By chance we had stopped the boat and were examining the gas which was running through one of the pipes, both of us bending over the partition which housed the engine. As I said before, we had turned off the power and the boat was only going under the momentum it had previously gained. All of a sudden we felt

(*Continued on page 78*)

Cruising Under the Shadow of Kletsa

(Continued from page 77)

a deep thud which sent us sprawling, and on gaining our feet we saw directly across our bows a tremendous log, fully sixty feet in length and eight in diameter, out of one end of which there sprang a smaller variety of the same species. Our guardian angel had assuredly been at our call, and we were ever afterwards blessing the poor gasoline which a few minutes before we had been so unjustly condemning.

Gasoline stations are unknown quantities at the water's edge in these localities so that we were forced to go to the nearby villages whenever we were in need of the precious fluid, which by the way, according to western Canada's figuring, was priced at from fifty-five to seventy cents a gallon, equal to five quarts of our gas. We were fortunate in that we consumed but thirty gallons during the entire four months we spent on the lake, covering close to eight hundred miles.

But before we left Kletsa, Arrowsmith, and the lake which Sproat found long before any of the western metropolises were even thought of, we built for our sturdy little craft and for our faithful jack-of-all-trades a winter lodging which would shield them from all inclement weather. A thirty by fourteen foot house we erected of cedar slabs, and in its rear we constructed an eight by fourteen foot room. The boat slip, part of which is open, is reached by rough rollers placed at two-foot intervals, along which our twenty-two-hundred-pound launch was hauled until beneath the rafters, when we lifted it by means of double pulleys seven feet above high water mark, and blocked it until the next time we set sail from Sproat.

The sun was just peeping through a thick October fog as we bade adieu to this charming spot, promising ourselves that as soon as it was humanly possible we would find ourselves back once more in the land where it was possible to travel night and day on a lake on an island, in the ocean.

Tidewater Cypress—Boat Wood, Supreme

John Lawson, writing about 1714, gives much interesting and valuable information about the uses of cypress for canoes as freight carriers, in those early days.

He tells us that cypress canoes sometimes carried cargoes of from 80 to 100 barrels of pork and other products, and these early freight carriers were not confined to the rivers and land locked arms of the ocean by any means, but frequently ventured upon the open sea, carrying their cargoes from Albemarle Sound to Chesapeake Bay by way of the ocean passage.

Builders of sailboats and small ships in the south in the early days, drew liberally upon cypress for planking, decking, spars, and other parts of the vessel, knowing how remarkably it resisted decay.

At present cypress is being used for all classes of boats, small home-made ones, as well as big cruisers and all the way between.

One of the well known characteristics of cypress is its ability to stand up under the everlasting wet and dry, hot sun and wet splash action to which all boats are subjected.

A cypress boat is not only unaffected by the stress and strain of wind and weather but possesses that quality of staunchness which is expected of all good craft which sail the raging main. And as an added attraction it offers the utmost longevity with negligible repair costs.

A cypress hull will rarely need replanking, something which all boatmen recognize as a ticklish as well as an expensive job.

The least deviation from a boat's original lines will many times take her out of the speed class and put her down among the third and fourth raters—the also finishers.

And because of all these superior characteristics, cypress is becoming more and more the first choice of well posted naval architects, and boat builders, professional and amateur, who use it, because a cypress boat is an everlasting boat, or, as some one has poetically put it, the cypress boat stays afloat, certainly a superlative trait in a boat.

So, in order that those who buy cypress may know they are getting the genuine All-Heart cypress, the Wood Eternal, the responsible manufacturers are identifying their product with a trade-mark arrow which is branded upon the ends of all boards and small sticks, the number of the mill producing it being found in the circle in the arrow—giving the buyer an assurance of careful grading and scrupulous count—every foot a foot.

Boat builders will do well to look for this trade-mark on the cypress they are asked to buy and thus be assured that they are getting the genuine decay-defying All-Heart Tidewater cypress, the world's best wood for the exacting demands which a boat is expected to meet and overcome, year in and year out, in fair weather and foul.

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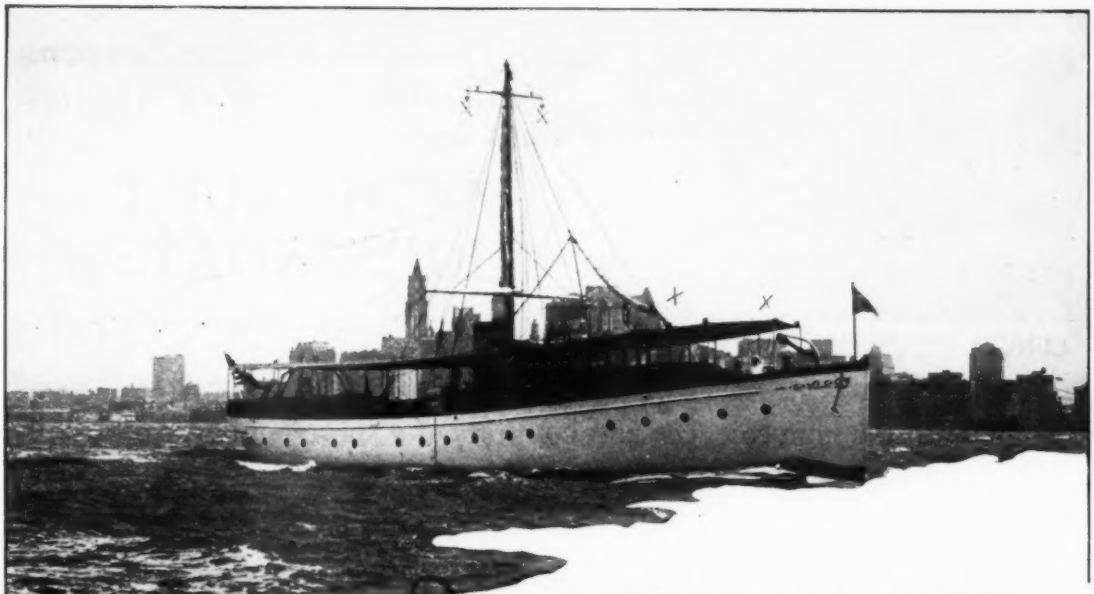

The SPEEJACKS

NINETY eight feet of comfort, luxury, romance and adventure, the Speejacks is bearing its owner, Mr. Albert Y. Gowan, Jr., and party, on a truly historic voyage around the world.

This craft is but one example of the unusual in yacht construction, which Consolidated is continually building to meet owners' special requirements.

All lovers of the water would be interested to see our Consolidated Runabouts—26 and 32 feet—now on exhibit at our Showrooms at Morris Heights. These are stock models for prompt delivery.

Owners of Consolidated built boats remain satisfied after years of service. "Ask the owner or his crew."

CONSOLIDATED
SHIPBUILDING CORPORATION
MORRIS HEIGHTS, NEW YORK CITY
FORMERLY
GAS ENGINE AND POWER CO.
Chas. L. Seabury & Co., Consolidated

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Performance—Not Promise—Is the Test

Read What Cap'n Rowley Says →

Joes Husky is designed especially for heavy work boats and oil burning motors. Insist on

JOES GEARS

FOR EVERY NEED AND SPEED
80% — 88% Reverse Speed Ratio

Write for new Catalog and Revised Prices for 1922, of our full line of Joes Reverse Gears, One-Way Clutches and Safety Rear Starters.

The Sea Coast Oyster Co.

MAIN OFFICE
38 SO. WATER ST.
NEW HAVEN, CONN.

OPERATING FARMS AT
WELLFLEET, MASS., WICKFORD, R.I., ROCKAWAY, N.Y.
MATTITUCK, N.Y., GREENPORT, N.Y.

November 4, 1921.

Messrs. Snow & Petrelli Mfg. Co.,
New Haven, Conn.

Gentlemen:-

Our latest boat the "SEA COAST" 90 feet long, 21 feet beam, 7 foot draft, we believe to be the best oyster boat on the Coast. She is powered with a 90 Horse Mianus Deisel Oil Engine, which is a dandy, driving her ten and one-half knots per hour, with a very small fuel consumption. She is a double gang boat, hoisting four dredges of ten bushel each, and her carrying capacity is about 3500 bushels.

This boat has been in operation for more than two months, and you will be gratified to know that your HUSKY REVERSE GEAR handles this outfit perfectly, and in that time has not required a single adjustment. We are very much pleased with this reverse gear, and can say it is the best one we ever used.

We would be more than pleased to recommend your reverse gear to anyone operating a boat, as it is so easy to handle. We believe our whole equipment both engine and reverse gear to be the best in the market.

Yours very truly,
THE SEA COAST OYSTER CO.
T.W. Rowley

FWR/AC

JOES HUSKY

Builders of High Grade Engines Who Assure Their Customers Gear Performance by the Extensive Use of Joes Gears

Smith-Liberty 12 Cylinder
New London Ship & Engine Co.
Dodge "Burnoil" Engine Co.
Mid-West Engine Co.
Kahlenberg Bros. Co.
Clay Engine Co.
Venn Severin
Gulowsen-Grei Engine Co.
Mianus Motor Works
Buffalo Gasoline Motor Co.
Gaeth Motor Co.
Bridgeport Motor Co.
Camden Anchor-Rockland Machine Co.
Gray Motor Co.
Hubbard Motor Co.

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Ignition Troubles Corrected

(*Continued from page* 58)

and thoroughly in motion. The manufacturers of Shursparc have very cleverly arranged for this change of quality in the spark by providing a control with several positions indicated thereon. The Shursparc Auxiliary Unit delivers a high amperage spark for starting a cold engine and as soon as the engine is in motion the operator turns the knob on the spark control, changing the quality of the spark from high amperage to a spark with higher voltage qualities. By this means better combustion is obtained, and the engine will run on a leaner gasoline mixture. This, of course, results in fuel economy.

It is a well established fact that efficient combustion prevents the formation of carbon. The added efficiency gained by the transformation and amplifying of the spark from the standard equipment ignition unit, by the use of Shursparc as an auxiliary, is such that carbon formation is reduced materially if not altogether eliminated. The higher voltage spark obtained by the use of this ignition auxiliary fires through the oil which has fouled the spark plugs caused by leaky piston rings. Plugs that have broken porcelains, or that are badly carbonized at the time Shursparc is introduced into the system, fire like new, and hence the comfort of the engine operator is greatly increased.

To sum up the advantages of this auxiliary ignition unit in a few words, it might be said that Shursparc supplies a spark that makes starting quick and easy. After the engine is started an unfailing, penetrating high voltage spark is delivered on each firing stroke of the engine, which assures greater power and speed; and finally it should be noted that the use of Shursparc permits of running on a leaner gasoline mixture which, of course, means fuel economy.

To the operators of motor boats such an auxiliary ignition unit as Shursparc should appeal. It is very simple to install, it is exceptionally well constructed, being made of the highest grade of insulating material; it is compact and takes little space. It is now being introduced by the Shursparc Ignition Corporation of Washington, D. C., for the benefit of motor boat owners throughout the country.

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Finding One's Way About In a Motor Boat

(*Continued from page* 33)

boat under such conditions would be decidedly less than the speed she was capable of in still or slack water. For example, a course of eight nautical miles up a river which has a 4-knot current flowing down, and a boat with a normal speed in still water of 8 knots. The time required for the boat to go up stream—that is, eight miles against a 4-knot current—will be two hours, and the time to return down stream with a 4-knot current will be only two-thirds of an hour. Thus, the total time required to go the sixteen miles, one-half of which is with the current, and the other half against the current, will be two and two-thirds hours. Dividing this time into the distance (sixteen nautical miles), gives us a speed of 6 knots as the average for the entire trip. This amount is 2 knots slower than the normal speed of the boat in slack water.

S=Normal speed of boat=8 knots
C=Speed of current =4 knots
Then time required to go 8 (nautical) miles up stream=2 hours
And time to go 8 miles down stream = 2/3 hour
Total time to go 16 miles (½ with and ½ against current) =2 2/3 hours

$$A=\text{Average speed}=\frac{16}{2.67}=6 \text{ knots}$$

$$\text{Time}=\frac{L \times S}{S^2-C^2}$$

$$\text{Normal speed}=\frac{A+\sqrt{A^2+4C^2}}{2}$$

When the direction of the current is at right angles to the boat's course.

Situations and conditions of this kind can be more readily solved graphically than by means of mathematics although it is, of course, possible to solve them by the use of trigonometry if it is so desired.

In the case of sailing directly across a current the most important problem generally is to determine the compass course to be steered in order to counteract the current effects. In figure 230, suppose it is desired to sail directly across Long Island Sound from Matinicock Point to Portchester Harbor or from point E to G. The distance between the two points is first determined from the chart and in this instance we find it to be exactly four miles. As our boat has a normal speed of 8 miles an hour it would require ½ hour to sail from E to G in still water. Next we determine the velocity of the current from our knowledge of local conditions or from some other reliable source. For the purpose of this illustration we will assume that the current is running west at a rate of 2 miles an hour. Now as it required ½ hour to cross the Sound from E to G in a northerly direction the tide would carry the boat one mile toward the west by the time the other shore was reached, and therefore instead of reaching point G as desired, the boat would be at a point one mile directly west of G. Therefore to assure reaching point G we must steer or head our boat on a course somewhat to the Eastward of north to counteract for this current which is constantly taking the boat to the Westward in her run across the Sound. To determine the necessary amount to the east of north which we must steer we lay off on the chart a line from G at right angles to EG and determine the point H along this line which in distance from G is equal to the flow of the tide during the time it would take the boat to go from E to G under normal conditions which in our instance is ½ hour. This is equivalent to one mile flow of the tide. Therefore the length of line GH is one mile. We now connect points E and H by a line and the direction of this line is the course which must be steered or the direction in which the bow of the boat must be headed to go from E to G with a westerly current of one mile an hour. It is now an easy matter to determine the direction of this line EH by transferring it to the compass rose on the chart by means of a course protractor. In our example we find this to be N x E ½ E.

To determine the length of time required to go from E to G.

Under these conditions it is only necessary to measure the length of the line EH and then find out what distance this length represents according to the scale of the chart. In our example we find the distance to be 4.2 miles and as the normal speed of the boat is 8 miles an hour it will therefore require .525 hour which is equivalent to 31½ minutes to make this run.

NOTE: This graphic method which has just been described is subject to a slight error but in cases where the speed of the current is less than 25% of the speed of the boat this error is so small as to be of no consequence.

When the direction of the current is oblique to the course of the boat.

If the direction of the current is other than dead ahead or astern or at right angles to one's course the case it not quite as simple but the course to be steered and the time required under conditions of a diagonal cross current may be quite readily determined graphically. Take in the case of Figure 230:

(*Continued on page* 120)

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A High Duty Power Plant for Boats

Stearns

Extra Reserve Marine Motor

A REAL departure from present standards of marine engine efficiency and value has been accomplished in the Stearns Marine Motor. A motor of the most approved design, built on a modern production basis in a modern factory, it embodies the highest quality and efficiency at a price never equalled for an engine of its class.

Stearns Motors have the largest crankshaft and connecting rod bearings of any motors of their size or power. They are lubricated by internal high pressure force feed system, with 5 lbs. to 50 lbs. pressure at various points, reaching every moving part of the engine. They may be operated on gasoline or kerosene without change and without noticeable difference in power. Every Stearns Motor develops its full rated power for several hours on electric dynamometer test before shipment.

20 H.P. to 100 H.P.
for heavy duty, medium and high speed service
4¼" x 6"
4½" x 6"
4¾" x 6½"
5⅛" x 6½"

All are valve-in-head four-cylinder motors. Furnished with open flywheel or as completely enclosed unit power plant.

Three years of high duty service by hundreds of Stearns Motors have demonstrated their ability and endurance. They have made good in heavy boat work because they possess the qualities that a successful marine engine must have. But their high efficiency and low cost have been attained by excellence of engineering and manufacturing methods, not by the ponderous weight and wasteful cylinder capacity of the old style marine engine.

Prices lower than ever previously quoted for high quality marine engines

Manufacturing economy is the result of the finest tool equipment now used in producing any motor of its class, representing an investment of more than $600,000 in machinery and patterns. Unlimited resources have dictated the policy of building only the best, regardless of capital expense.

Write for complete data and prices.

Stearns Motor Manufacturing Co.
LUDINGTON, MICH.

Speed and Power

PUT new ambition into your motor by installing a set of DELUXE Light weight Cast Iron Pistons.

You will be amazed at the increased speed and power DELUXE Pistons develop. You can hardly believe it is the same motor which runs so smoothly —all the old vibration gone. And at the same time you are using far less gas and oil.

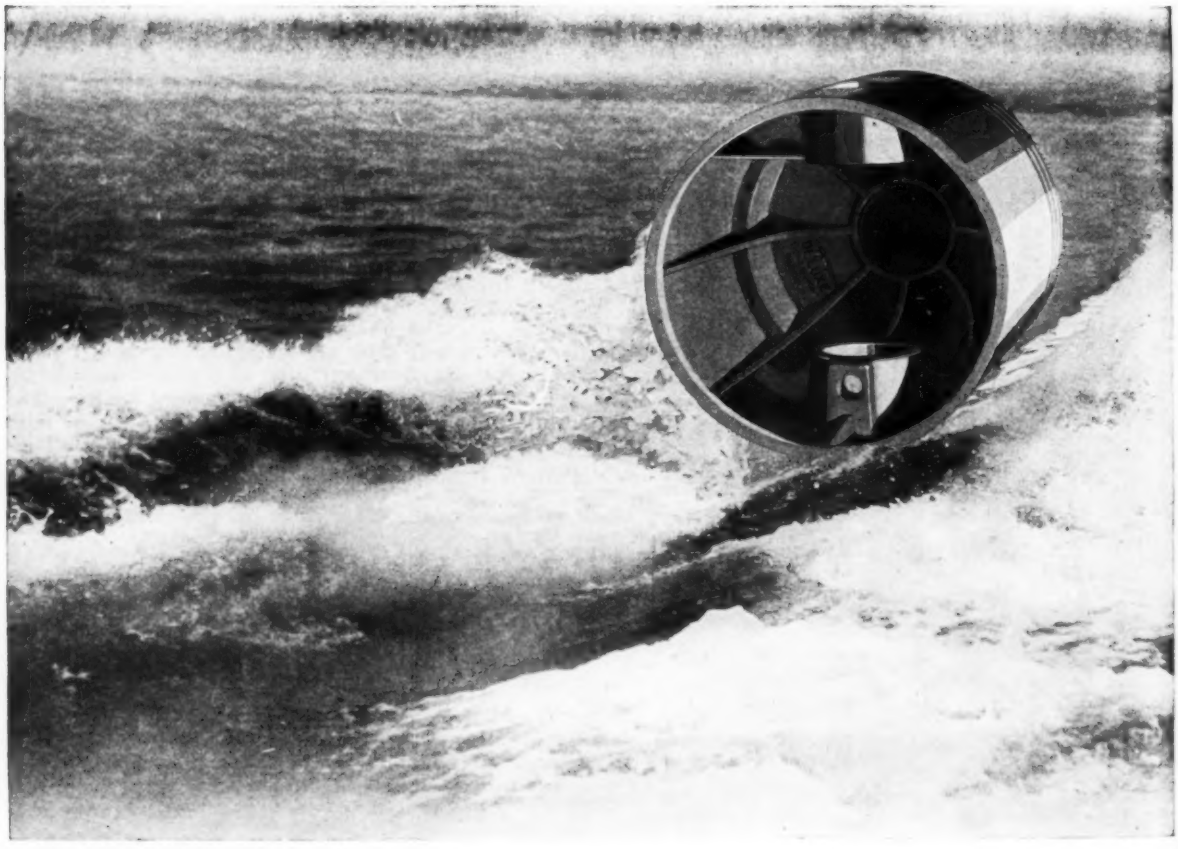
DELUXE Pistons are very light and very strong, due to their scientific, patented reinforcing rib construction. They make your motor run cool, and eliminate piston slap and leakage of gas and oil.

There's a set of DELUXE Pistons for YOUR motor. You can get them in 24 hours, or less, from your dealer or repair man. Our distributors are listed in Chilton's Automobile Trade Directory, (Red) Automobile Trade Directory and Might's Canadian Automotive Directory.

Look inside—
You can't go wrong.

DELUXE
LIGHT WEIGHT CAST IRON PISTON
The Successful Light Weight Piston

Very light
And very strong.



Patented and Manufactured by

Clark-Turner Piston Company

INCORPORATED

Los Angeles, California

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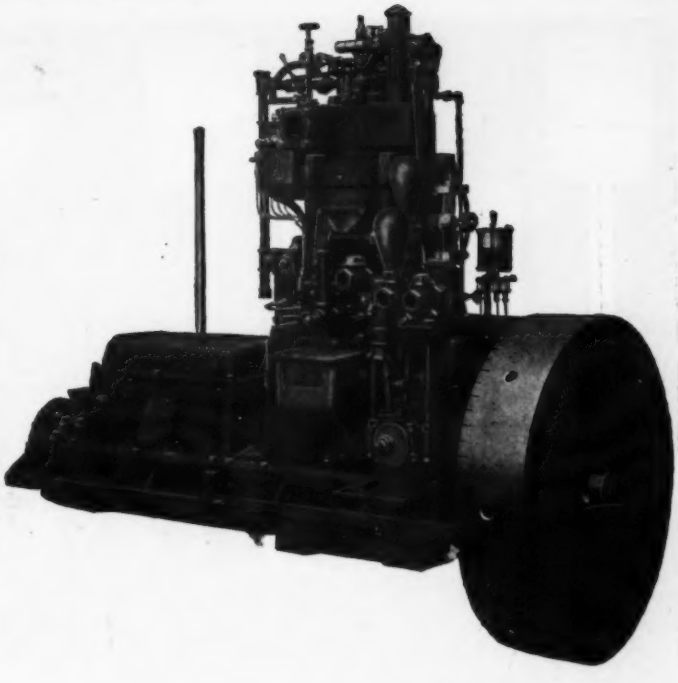
The power of six with the simplicity of one



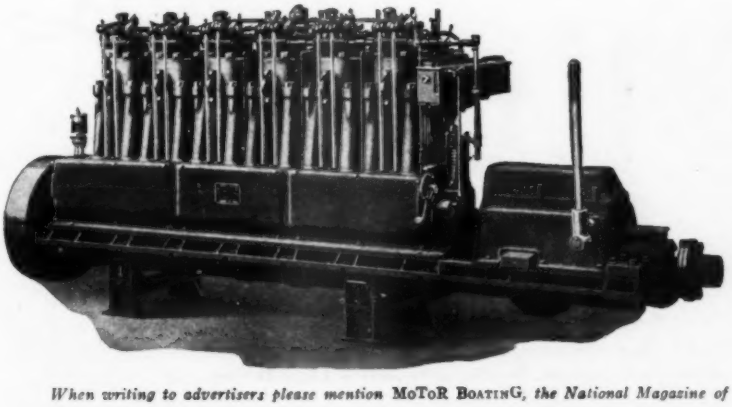
Between the one cylinder Dodge Heavy Oil Engine, Marine type at the right and the six cylinder one below there is a wide gap—*in power only.*

The mechanical simplicity of the one is duplicated in the other.

Dodge Heavy Oil Engines, Marine type, are built up of cylinder units. A six cylinder Dodge Engine is simply six one-cylinder units mounted on one crank case.

Each cylinder of a Dodge engine develops 12½ horsepower. With five sizes to choose from—one, two, three, four and six cylinders—there are no wide variations to force over-powering.

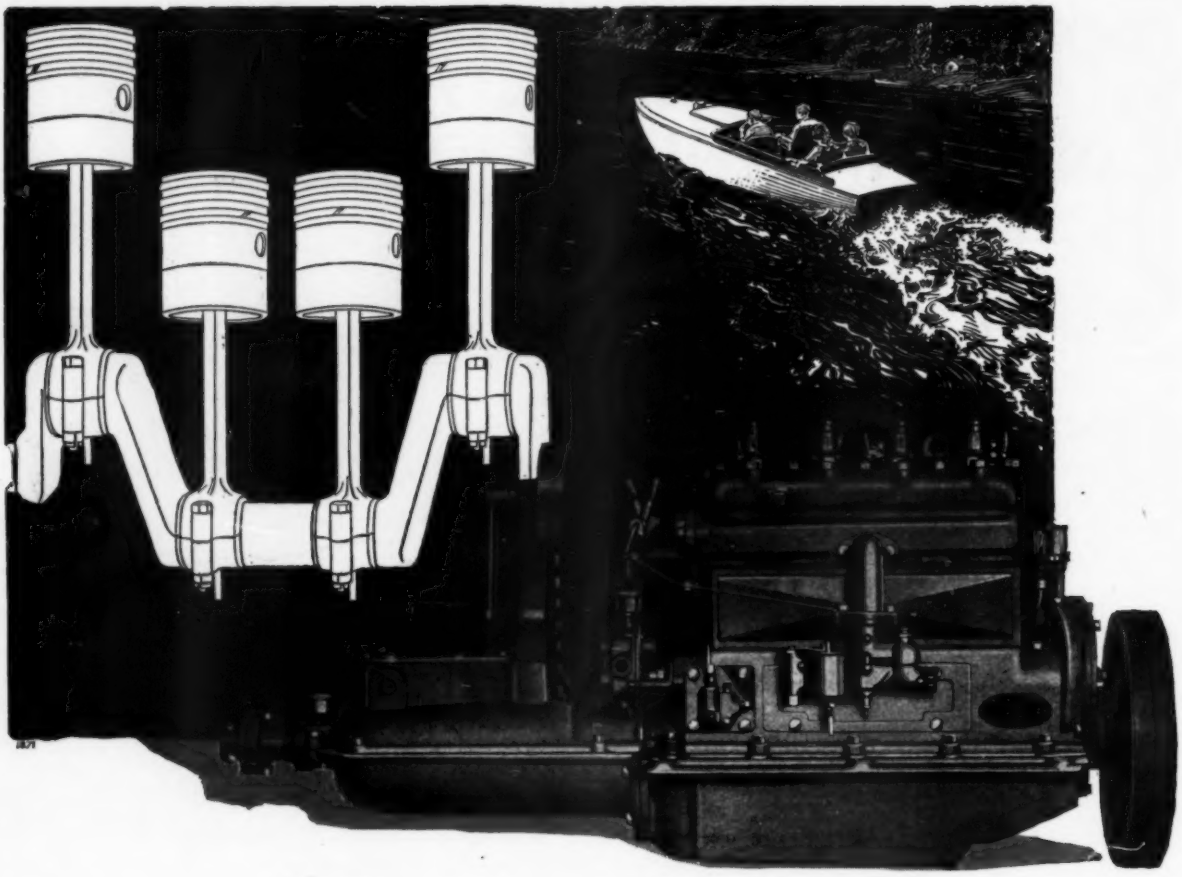
Further, each size does not vary so radically in construction as to require extra study and grief when one graduates from smaller to larger boats.



Anyone that can handle—and anyone can handle—a single cylinder Dodge Heavy Oil Engine, Marine Type, is master of the six cylinder even before he buys it.

Dodge Sales and Engineering Co.

Mishawaka, Indiana, U. S. A.



Four cylinders mean *real* motorboating

THE moment your boat is equipped with the UNIVERSAL four-cylinder, you've got a thrill coming to you in motorboating that you never knew before. Gone is the muss and tinker and noise and uncertainty that goes with ordinary engines—and now comes the quiet, the smoothness, the luxury of this famous, dependable power unit.

Only those who have graduated from the ordinary motor to this UNIVERSAL satisfaction, can realize what its ownership means.

The UNIVERSAL is the recognized standard, four-cylinder, 9-12 h.p. marine engine for 80% of all types and sizes of motorboats—from the small high speed runabout to the larger family launch—and for dories, fishing boats, work boats, etc.

It is built completely in the Universal factories and backed by 22 years of engine-building experience. The whole world knows its quality and reliability — for every continent of the globe has Universals in use.

Get your Universal engine now. Its cost is surprisingly reasonable and its worth makes it the most satisfactory investment you ever made. Send for complete catalog today, and tell us what kind and size of boat you figure on.

Universal

4-Cyl.
9-12 h.p.
MARINE ENGINE

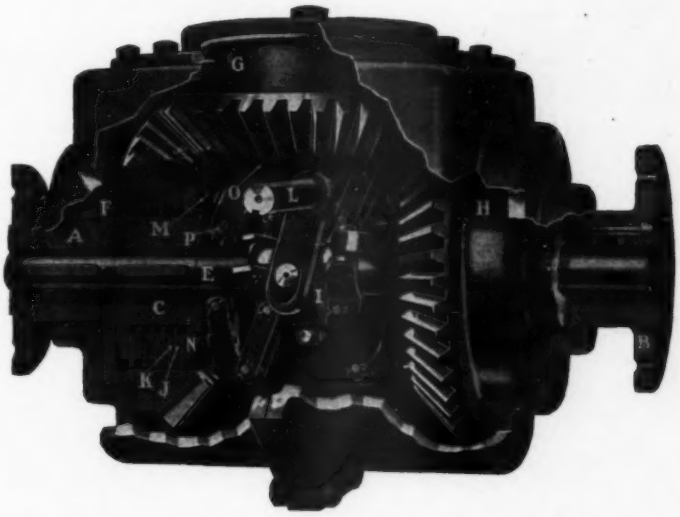
UNIVERSAL MOTOR CO. Oshkosh, Wis.

Not connected with any other firm using the name "Universal"

Manufacturers also of the UNIVERSAL four cylinder, 4 k. w. and 2 k. w. Electric Plants for lighting boats, summer camps and homes, farms, etc. Send for catalog.

Advertising Index will be found on page 138

Meeting the Insistent Demand for A



More Efficient More Reliable More Trouble-proof Reverse Gear

Experience has convinced us that the great unsatisfied demand of the marine industry has been for a reversing mechanism of genuine mechanical efficiency, high reverse speed and minimum power loss, combined with simplicity, durability, silent operation and reliability.

Experience has further demonstrated that the usual planetary type of gear cannot ever be built to meet all these requirements. Its multitude of small gears with small teeth, small bushings and small pins, all subject to rapid wear and easy breakage, makes good mechanical efficiency and silent operation impossible. So much power is absorbed in the planetary gearing that the reverse drive must be geared down to 50% to 60% of the engine revolutions in order to have sufficient power left to back the boat.

We ask you to study the simplicity of the McKinnon Gear as shown above. Just three big bevel gears with large strong teeth having broad contact faces. Two big nine-plate multiple disc clutches—a separate clutch for each direction. The whole mechanism enclosed and running in oil. Same speed forward and reverse.

Electric dynamometer tests have proved that the mechanical efficiency of the McKinnon Gear is over 97% at 1,000 R. P. M.—less than 3% power loss on either forward or reverse. Three years of service in heavy boats have demonstrated that the McKinnon Gear stands up under hard service and actual abuse. The clutches engage smoothly, may be slipped continuously without damage and have greater holding power than required.

Write today for full details and report of tests, giving details of your engine including R.P.M.

Four Sizes Ready for Delivery

No. 1 transmits 4 H. P. per 100 R. P. M.
No. 2 transmits 8 H. P. per 100 R. P. M.
No. 3 transmits 13 H. P. per 100 R. P. M.
No. 4 transmits 20 H. P. per 100 R. P. M.

Other sizes in construction
Absolutely Guaranteed for One Year

McKINNON IRON WORKS COMPANY

Established 1880

ASHTABULA OHIO

Divers Experiences

(*Continued from page* 28)

we would here have parted company with all our gold plate and pieces of eight, but now the pirates no less than their stronghold lie buried beneath the sea, victims of an avenging earthquake, and we did not pay them even the courtesy of listening for the mythical submerged church bell that tolls their requiem. We were more practically occupied in following the lighted aids up the broad harbor to Kingston.

The wind left us when we were within a few cable lengths of our desired anchorage off the Royal Jamaica Yacht Club, and so at ten o'clock we ended the run as we had begun it—under power. It was the blackness of the night more than the stirring of a guilty conscience that led us to anchor off the state penitentiary, but there, when daylight came, we found ourselves the objects of many longing glances from the trusties working in the prison yard.

And there, mirrored in the calm sea of a tropical morning, it is well to leave Hippocampus while I record a decision that has been forced upon us. We are not going from Hell Gate to the Golden Gate, deliciously as the phrase rolled off our tongues, and much as we want to complete the ambitious cruise upon which we embarked three months ago. I first preached the gospel of nonfufillment (candor compels me to accept full blame for it) when we lay becalmed off the coast of Cuba. Days were slipping by as rapidly as sea miles, and I then saw that we could not complete the cruise in the four months which, for reasons of a combined personal and business nature, I had allotted to it. The subsequent run of 325 miles from Cienfuegos to Port Antonio, upon which we lavished six days, clinched my decision.

Another year and I may complete the distance, but now a shrinking, embarrassed glance from calendar to pocketbook tells me that it's time to hurry home. Paul and Al agree that it is possible to take too much of a good medicine in one dose, and so, regretfully, we have revised our motto to Balboa or bust. There is still the widest part of the Caribbean ahead of us, with its 550-mile jump to Colon, and the possibilities of adventure within the space of a few days are unlimited.

But nothing short of a hurricane can bring us face to face with such danger as menaced Hippocampus here in Kingston Harbor. We anchored, as has been told, on a calm night, and awoke to find the water glassy smooth. What more natural than to assume that the hook we always use and the scope we always give would hold us while we trooped ashore to get our mail? At any rate, we did assume it, and nine o'clock saw us rowing blithely down the bay to the boat landing of the Myrtle Bank Hotel—which is famed, I may add irrelevantly, for its rum punches.

Ashore, there were calls to be made—on the British port collector, who wouldn't accept my word that Hippocampus is a yacht, entitled to yacht privileges, and had to be pacified with a letter from the delightful and hospitable American consul, C. L. Latham, on the consul himself, and on the secretary of the tourists' association, who was anxious that we view Jamaica through friendly eyes. And while these calls were being made the "sea breeze," as the landlubbers call the southeast trade, was sweeping up the streets of Kingston, blowing dust impartially into the eyes of the just and the unjust. Along toward noon I called up the yacht club to ask the caretaker whether he could see Hippocampus from the veranda and whether she was standing the gaff.

"She's all right now," he replied, and the qualifying adverb of time so disquieted me that I asked the two Joes to return aboard while I paid another call ashore. They, as I learned when I joined them on the tossing, quivering Hippo, received at the Myrtle Bank a belated message to return immediately to the ship, and, determining in one glance that they could not row the dinky up wind to our anchorage, piled into a hack and hurried to the yacht club. They were greeted there by Harry and Arthur O'Toole, sons of the superintendent of prisons, who rowed them to the yawl, and related the danger that our careless seamanship had exposed her to.

Hardly had we left the boat in the morning when the trade wind sprang up, and in a short time Hippocampus was lugubriously dragging anchor toward the sea wall. The O'Toole boys, accustomed to the strength and persistence of the wind, lost no time in gathering together a crew of prisoners and putting out in a motor launch. For a moment they moored the yawl to a schooner under whose bows we drifted by the scantest margin of safety, but then, fearing that the weight of the two boats would drag the schooner's anchor, they hauled in our own, towed us farther out from shore, and moored us with our heavy hook

(*Continued on page* 104)

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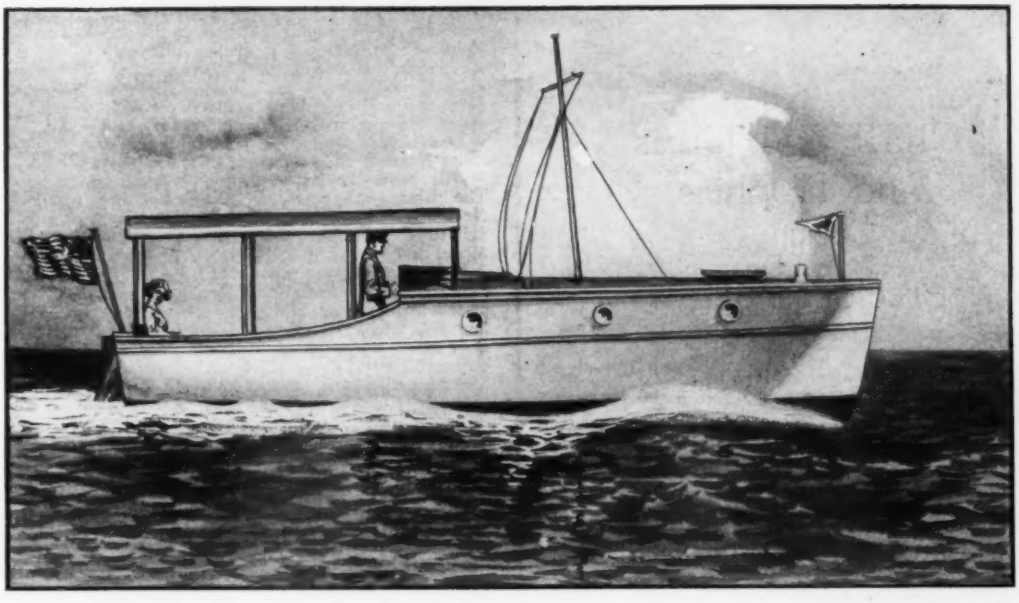

A Boat Without a Competitor

A REAL BOAT FOR THE REAL BOATMAN

27′x8′-6″x2′-8″ complete to the last detail

Built by experts who know how, in a yard that has built boats and which has every facility for the most careful and skilful workmanship the "Delanco 27" embodies the best of workmanship and materials.

Cruise where you will you have a boat that affords you every comfort whether it be day or night. Perfect in every detail—Built for hard usage and long life we offer to you the

DELANCO 27

a boat we will all be proud of and glad to compare with boats costing twice the Price of

$1,500 Complete, including tax

4-cylinder 4-cycle motor, 2-burner stove, toilet, sink, compass, bell, flags, flag poles, awning, anchor, anchor rope, lights, cushions for cabin and cockpit and everything else that goes to make a boat ready for her first cruise is yours in the Delanco 27.

Write today for complete description

The Delanco Ship Building Co., Inc. Delanco, N. J.

Divers Experiences

(*Continued from page* 102)

and with another requisitioned from the prison launch. It sounds simple in the telling, but, feeling the force of the wind against my cheek and seeing the viciousness of the waves breaking against the masonry wall, I knew that the O'Toole boys had done us a service that we could never hope to repay. They had saved Hippocampus from an untimely end.

The chapter of our day's troubles was not yet written, as Al and I learned when we went in the calm of late evening to the Myrtle Bank landing to pick up our tender and row it home. The painter was where we had left it, but the dink was gone. Naturally enough, Hippocampus Minor (as a surgical friend has dubbed the dink) had followed the example of Hippocampus Major and started on a cruise of its own.

Being by now somewhat accustomed to the vein of good luck that streaks all our misfortunes, we were not in the least surprised to find that the first boat we hailed in the darkness belonged to the water front police, who took us aboard and in less than five minutes of haphazard searching rowed us to the spot where, high and dry, some kind Samaritan had beached the dink. Thanking the police and crossing their colored palms wi' siller, we took possession of the truant and returned aboard.

Perhaps the northern reader, the navigator of civilized bodies of water like Long Island Sound and Buzzards Bay, will care to know something of Kingston Harbor and of the trade wind that makes it ideal for sailing and vile for anchoring. The bay, lying east and west, is about eight miles long and two miles wide, and is shaped somewhat like a race-track oval that has been distorted by an earthquake. Having at its southwest side a deep, narrow opening, it is otherwise separated from the sea by a long arm of sand known as the Palisados, where in years past grew a palisade of palm trees. Now the Palisados is bare and interposes no barrier against the wind which sweeps in from seaward. Port Royal occupies the extremity of this spit.

Kingston's waterfront is about midway of the bay, on the mainland, and the Royal Jamaica Yacht Club, where the local sailing craft assemble, is approximately a mile to eastward of the city, and three and a half miles from the upper end of the Palisados. Prior to the last hurricane a partially submerged hulk formed a breakwater for the club anchorage, but that slipped into deep water under the buffeting of wind and wave, and now there is no shelter.

The morning after the dragging of Hippocampus we were all on deck, basking in the stillness of the bay and air, and talking with the O'Toole boys, who had swum out bearing gifts of pineapples and coconuts. Little Guineth was there, too, a twelve-year-old mermaid whose last name I forget, who during our stay in Kingston has visited us daily and delighted us with the imperious manner in which she rules her court of adolescent mermen. Suddenly Harry exclaimed, "Here comes the Doctor," and pointed seaward. Expecting a visit from the quarantine officials, we paralleled his glance and saw instead a slight riffling of the bay's surface. "The trade wind," added Arthur. "It comes every morning between nine and ten and blows like the jooce."

We watched its coming until we were interrupted by the prison launch, arrived to retrieve the loaned anchor, and by my decision to put over our light hook in addition to the heavy one. On subsequent mornings, however, we have watched the daily awakening of the trade and have found it always the same and inivariably fascinating. First comes the faint disturbance of the surface to which Harry had called our attention. That passes and is succeeded by a brief interval of calm. Then another agitation of the water, well over to the seaward side of the bay, a caress of the rising wind which is suddenly duplicated in a dozen places. Soon the ruffled patches merge, and the effect of the wind, but not the wind itself, is seen to advance in a long line across the bay.

Until now the air in the vicinity of Hippocampus has been breathless, and we have idly revolved around our anchor rode; but soon we feel a vagrant breath of air against our bare arms and shoulders. The yawl, like an animal on the alert, ceases her purposeless movement and points seaward, facing an unknown danger. The advancing ripple, now augmented, brushes past us, the hollow tubes of the mizzen turnbuckles whistle a shrill defiance, Hippocampus tentatively dips her forefoot, and we are embarked upon our daily tussle with the wind.

Starting leisurely, by midafternoon the trade has whipped itself up to a thirty-mile gait, and the waves, sweeping across the bay, alternately dip our bowsprit and bumpkin under. Sometimes, as on the day after our arrival in Kingston, the wind attains a forty-mile strength, and then the O'Toole boys, youthful water dogs that they are, stand by in their bathing suits to give help where it is needed. Generally by six in the evening the breeze has died away and the bay resumed its placidity—a condition maintained until the next morning's visitation of the Doctor.

Sailing races never become drifting matches in Kingston, but,

(*Continued on page* 110)

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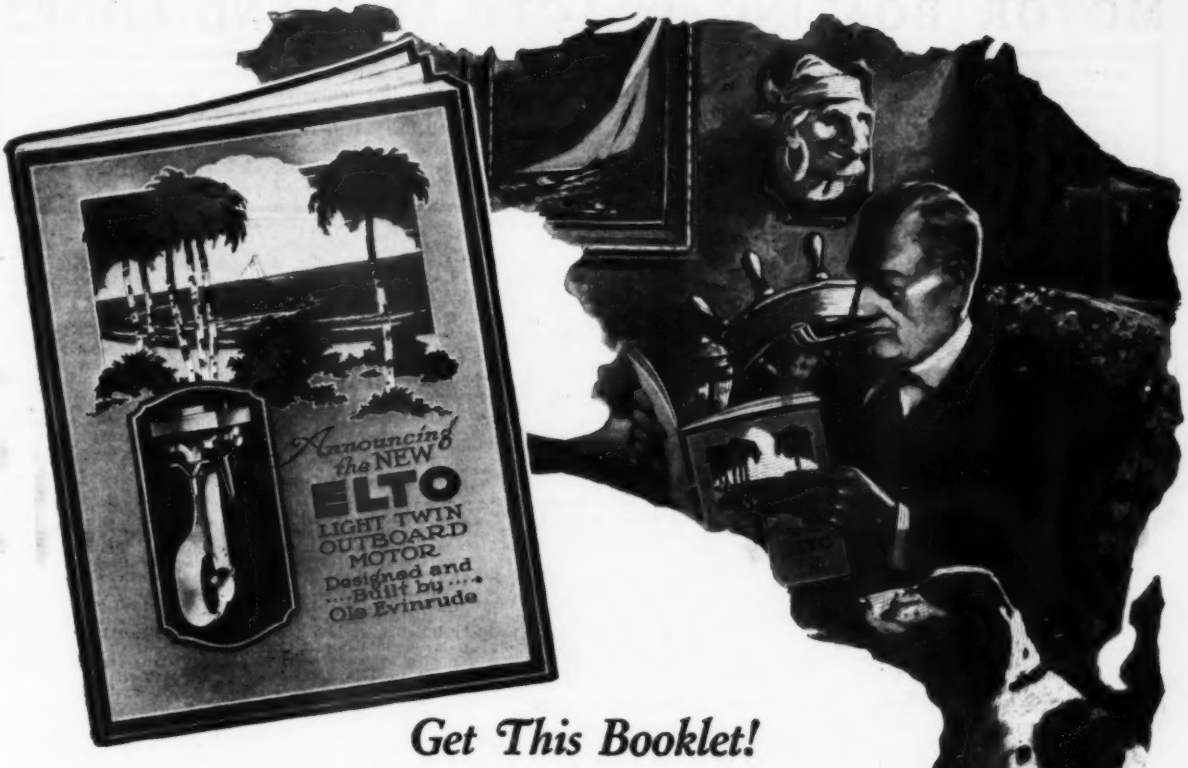

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An Interesting Story About Ole Evinrude's New Motor

FILL the old jimmy pipe, settle down comfortably in the big easy chair and prepare—some evening soon—to spend an interesting half-hour with Ole Evinrude's remarkable new motor, the Elto.

Be ready for surprises—you'll get them a-plenty. Nineteen exclusive features—an epoch-making achievement in the outboard motor field! Vitally important improvements which, in the past year, have demonstrated their practical value to yachtsmen and established the Elto in a position of leadership.

The 1922 Elto is now ready; has every requirement you could wish for—and don't forget: 19 big exclusive features! For example—light weight, a 2-cylinder motor weighing only 47 pounds; vibrationless operation; Atwater-Kent ignition, unsurpassed for quick, easy starting; automatic tilting of motor—and 15 other exclusive features!

Get the whole story of Ole Evinrude's biggest achievement from the Elto booklet. Get it NOW. Write today.

Elto Carrying Case

Comfortably Portable

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Elto

Light Twin Outboard Motor

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantage of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propellor-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it: Advice for the Beginner, Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsucessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed *vs.* Heavy Duty; Long Stroke *vs.* Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers *vs.* Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbitting a Worn Bearing; Should Fuel Line be Inside or Outside?

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The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR Boating 119 West 40th Street, New York

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"A Kermath Always Runs"

KERMATH

Big Reduction in Prices
New Prices $135 to $1550

DURING the winter months most marine motor manufacturers have to lay off many men due to a lack of business.

This year instead of laying off all of our best men we are going to run our plant by giving a big price advantage to all buyers who are ready to buy a motor at this time.

We will ship the Kermath motor you select immediately or else we will be glad to warehouse your motor for a reasonable period.

Everyone who knows anything about marine motors realizes that the largest part of the marine motor selling season is over for this year. Therefore there is bound to be a natural drop-off in business and a shutting down of many plants.

But we do not intend to shut ours down. We figure by this great reduction in prices we will be able to stimulate enough business whereby every buyer gets a real bargain and we keep our men at work.

Remember we reserve the right to withdraw these prices without public notice at any time.

Please let it be understood that there is no guarantee that these prices will continue.

If you are thinking of building a boat next spring or buying a new engine for your old boat, now is the time to make your investment for you will be able to save a considerable amount of money.

Write immediately our Dept. "D" for more information, full details and literature about the Kermath motor, the world's standard.

KERMATH M'f'g Co.
DETROIT 5880 Commonwealth Avenue **MICHIGAN.**

New Two-Cylinder Frisbie Motor

(*Continued from page* 54)

head so that the head must literally be more than full of water before it can overflow. This point absolutely prevents the formation of any steam pockets in the water jacket of the cylinder head.

The cylinders have been made very thick, with large water jacket area, not only for the purpose of giving strength, but moreover to allow the cylinders to be rebored after the motor is ten or more years old and also to leave more metal to withstand the action of salt water in the water jackets.

In the design of the cylinder a long skirt has been provided which extends into the upper base of the motor, thus giving the piston bearing through its entire length of stroke. This also allows a very rigidly installed cylinder, one that is not easily worked loose.

The practice of carrying the gas ports within the cylinder head and side of the cylinder to a point lower on the cylinder than the head itself also makes possible that which is unusual in a four-valve motor, the use of a combination exhaust and intake hot spot manifold. A great deal of attention has been paid in the design of this motor to the practicability of securing cylinders, and heads, in which a smooth gas passage can be cast.

The base is of split type construction, all bearings being hung in the upper half. This upper half base is designed with a rib running across between each cylinder, and with other ribs in line with the forward end of the front cylinder, and the back end of the rear cylinder. The lower base is heavy and strong, extending underneath the reverse gear and forming the foundation member of the engine itself.

The main oil system of the motor itself is not only efficient but absolutely complete, and this is one motor on which there is not a single grease cup used, nor is there a place for an operator to go with an oil can and lubricate anything. Absolutely everything on the motor is lubricated from the main oil pump, and as proof of the completeness of this system let it be noticed there is not even an external pump shaft or ignition drive shaft to be equipped with a grease cup.

The oiling system itself is a combination of pressure and splash and to secure oil pipes within the base of the motor that must always be tight and clean inside a novel practice has been employed. In the past, attempts have been made to cast oil pipes in the iron of the base. That has not proven successful for the reason that the cores must be small, and it was generally the case in that practice to have resulting oil pipes clogged with iron that must be drilled out, the drilling making a plugged base and, of course, undesirable.

A large rotary pump is installed for the pressure system in a sump in the lower base. Because of this being in an oil sump it is below the level of the oil itself and always primed, and moreover the fact that it is operating in oil greatly prolongs its life and reduces to a minimum the wear of the pump. From this pump through the pipes within the base, the oil is led under pressure to each of the main bearings, to all of the gears driving the camshaft, to the gears driving the ignition devices. The oil working back on the bottom of the lower base is picked up by the connecting rods for the connecting rod crank pin lubrication, and the piston, cylinder, and cam lubrication. One small valve, operating the by-pass, regulates the pressure. The oil gauge installed on top of the back end of the upper base indicates the pressure and this gauge can be either left on the motor or else placed on the bulkhead, near the operator, if the boat be of the one-man control type.

The Reverse Gear, while installed in the lower base, is in a separate compartment so that no bronze filings or steel points coming from the wear of the gear can be brought into the main base of the engine itself and work into the bearings.

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Wisconsin

CONSISTENT

Marine Motors

VAGABONDING de luxe—exploring in strange waters—visiting the places so far only familiar through the printed word—the ambition of many and realization of only a few.

Made the more interesting and pleasing because of a dependable motor whose value grows as the distance from service and repair stations increases.

A motor with a reputation for getting there and coming back—without a temperamental quitting streak that appears at inopportune times.

Wisconsin Motors have real friends everywhere motors are used, for their sticking qualities. That's why you find them in fishing boats, in work-boats, in life saving and fire service—where dependable power is needed all the time, and trouble is conspicuous by its absence.

Marine catalog will be mailed upon request.

Built in the following sizes:

EM	4 x 5	4 cylinder
AM	4¼ x 5½	4 "
MM	5¾ x 7	4 "
GM	4¼ x 5½	6 "
PM	5¾ x 7	6 "

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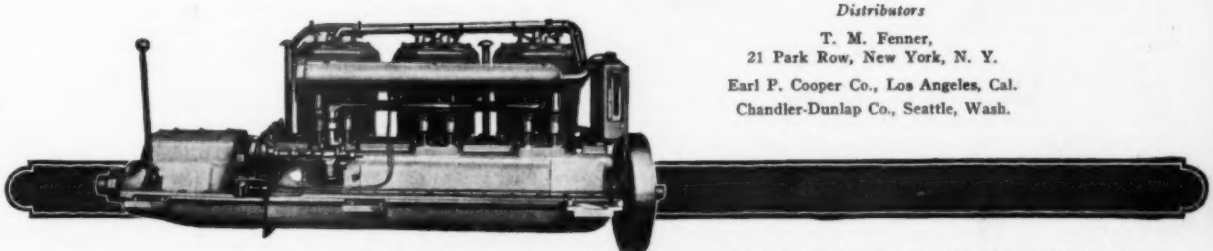

Divers Experiences

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to the contrary, more than one has been won by the last man to remain afloat. This is all very well for those who are born and brought up in Kingston and know no respite from the tropical trades, but if ever I visit this delightful island by yacht again, I shall moor my craft in the snug harbor at Port Antonio and journey to the capital by rail.

In a previous paragraph I mentioned a hulk that had been used as a breakwater for the yacht club anchorage. For several years it has been lost—but we have found it. On our first day in port, following our seance with the dragging anchor and our rescue by the O'Tooles, the two Joes returned aboard, got up anchor and then, maneuvering off the yacht club, let go at precisely the spot indicated by a kindly stranger ashore. Our seventy-five-pound anchor, descending with the uncanny magnetic attribute of a lodestone, drew itself to the submerged wreck and became entangled in its iron ribs. We were more securely anchored than we knew, and the other hook which we put out the following morning as a precaution was only an aggravation of our difficulty.

That evening, meaning to haul in the light anchor to prevent the two lines from fouling overnight, we found that it would not budge, and although we were then unaware of the existence of the hulk, we surmised that our customary in-port luck had again got the better of us. So two days later, when we had completed arrangements for hauling out the yawl to paint her bottom, we buoyed both lines and sought the west end wharf of the United Fruit Company, leaving in abeyance the disentanglement of the anchors.

Native boys, at home in the water as on dry land, placed us over a cradle and blocked our keel, and in a few minutes a gang of blacks, sweating profusely over a windlass, had hauled us up the marine railway. Then we got into difficulties with Jamaican law. Being out of water we found that we shouldn't be there, but, being out, we would be permitted to remain overnight provided we were forthwith fumigated at a cost of five guineas. Otherwise we must launch again before six o'clock to frustrate the rats which (it would appear) always leave the barren interior of little yawls between the hours of sunset and sunrise and spread pestilence among the unsuspecting inhabitants of the island. Rather than break the law or—a more important consideration—pay five guineas for fumigation, we determined to do a two-days' job in one, and, working uninterruptedly, we were actually able to paint the sides and bottom in less than six hours.

This was the first time we had hauled out since our accident at Mayport, and we were relieved to find that aside from a slight softening of the seams near the spot which had received the impact of the ten-ton bolder, our underbody was uninjured. Moreover, thanks to its liberal coating of bronze paint, the bottom was as clean as if we had taken the water three days instead of three months previously. This, I think, speaks volumes for the efficacy of bronze composition, inasmuch as for two of the three months we have cruised through waters in which the teredo and marine growths are notoriously destructive.

Going off the ways in the late afternoon we moored to a barge nearby, and resignedly awaited the passing of Sunday and Emancipation Day, August 1, on which date the negroes celebrate the liberation of their forefathers from a state of slavery.

On Tuesday afternoon, following a luncheon at the Jamaica Club as guests of Commodore W. Baggett Gray of the R. J. Y. C., Al and I went aboard the American tug I. J. Merritt and sought an interview with her salvage captain, J. J. Johnson. He is an enthusiastic yachtsman, the part owner of a local sloop that has raced and won in northern waters, and in his official capacity he has salvaged nearly all the American yachts that have stranded on Caribbean shores during the last twenty years. We laid before him our petty troubles—two anchors and their lines hopelessly entangled in a wreck—and he was as interested and concerned as he would have been at the tale of a palatial yacht gone aground on Roncador Reef. More, he was sympathetic, and out of the kindness of his heart offered to send down a diver for the mere cost of his services.

This cost—and it was smaller than one would suppose—was so much better than the regular fee of $25 a dive that we left the tug greatly elated, promising to return early the following morning and lead the way to the buoyed cables.

Strangely enough, we were as good as our word (although a life of cruising begets bad habits in the matter of punctuality) and six o'clock saw us shoving off with Captain Johnson in the diving launch, Hippocampus looking pretty small awaiting our return alongside the I. J. Merritt. Arriving off the yacht we were pleased to find the buoy still afloat, and were yet more delighted, after a spasm of bubbling from the bottom of the bay, to be told by the diver's helper that we might haul away on the heavy anchor. A few minutes later the other line was liberated, and long before the Doctor had paid his morning call we were breakfasting aboard the Merritt, our anchors on Hippo's deck and their lines neatly coiled by members of the tug's crew.

Gratifying as it is to be the recipient of kindnesses such as

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A. P. B. A. Makes Important Changes in Racing Rules

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hull and power plant. There are several stock motors which will conform to the specifications and which will take in practically every suitable motor on the market today of a hundred horsepower or less. It would not be surprising to see at next year's Gold Cup Race at Detroit, instead of 2 or 3 boats coming to the starting line, 25 or 30 or perhaps more. Several designers have already started to bring out plans for boats to fit this class and several localities such as Buffalo, Hamilton, Cleveland, Toronto, Detroit and elsewhere are actively at work on classes of one design boats the ultimate object of which is to compete for the Gold Cup.

In addition to the limitations of length, beam and piston displacement, a number of other specifications were approved which will make the boats competing for the Gold Cup real boats in every sense of the word. The race will consist of three heats of approximately 30 miles each held on consecutive days on a 2½-mile course.

The hulls of the competing boats must have no breaks in the longitudinal continuity of the immersed surface, not more than one lifting surface and must conform to the committee's ideas of what is generally classed as a displacement type. The keel and chine (or bilge) must be continuous and must extend from the bow to the stern (or stern post). Steps, either transverse or longitudinal, will not be permitted. Surfaces on each side of the keel line between the keel and the chine (or bilge) must be continuous and not contain breaks, jogs or notches of any description. (Sea Sled model acceptable.)

Competing boats must exhaust at the stern or under water when underway and must be fitted with at least two transverse bulkheads practically watertight, have motor compartment entirely closed in and have seating accommodations for at least four persons. No postponements from the advertised time of start shall be permitted for any cause. Boats must be equipped with efficient reverse gear, and gear box or any arrangement to make the propeller turn faster than motor speed will not be permitted.

A number of changes were made also in the Deed of Gifts governing the Fisher-Allison and the Wood-Fisher Trophies. However, when the changes which were made have a bearing on boats actually in existence or under construction at the present time, changes will not go into effect until January 1, 1923.

The principal change in the Fisher-Allison Race will be the reduction in the piston displacement after January 1, 1923, from 3,000 cubic inches to 1,600 cubic inches. The power plant will also be limited to one stock marine motor.

Another important change was the addition of a provision which gives power to the Race Committee to permit a boat which does not finish in any heat to start in another heat, if in their judgment it is for the best interests to allow such a boat to start; provided the boat or boat's representative has reported to the Race Committee before the boat withdraws from the racecourse and has received permission to withdraw from the course in order to make minor repairs, adjustments, or to refuel, and has taken an observer on board and has made the necessary minor changes with the observer on board and in accordance with the terms and spirit of the Deed of Gift, i. e., made by members of the crew and with parts and tools carried on board during the race. A boat which does not finish for this reason shall count as a defeated boat for the heat, shall receive no points for the heat and shall be penalized one point for the privilege of starting in the next heat.

Provision was also made that the plans of a challenging boat

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A. P. B. A. Makes Important Changes in Racing Rules

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may be submitted to the Secretary of the Racing Commission of the American Power-Boat Association any time previous to the race and if such plans be approved then the boat shall be acceptable to the Race Committee and shall not be subject to disqualification as not complying with paragraph S, Article VII. (This rule in no way takes the power of disqualification for failure to comply with the other terms of this Deed of Gift or the racing rules away from the local Race Committee. The local Race Committee will also have power to disqualify if the boat is not built according to the plans approved by the Secretary of the Racing Commission.)

In the Wood-Fisher Deed of Gift the same change in reference to making a new start as mentioned above in connection with the Fisher-Allison race was approved. In this race also the total maximum piston displacement was reduced from 3,000 cubic inches down to 2,250 cubic inches to take effect immediately.

A number of slight changes in the rules governing cruiser races were approved, but most of these were in the nature of revisions to the existing rules. A new rule providing for inspection was passed as follows:

1. The local Race Committee shall have one of its members or another qualified representtative make a complete inspection previous to the start of every race of all boats entered to see if the requirements of these rules and the Circular of Conditions have been complied with.

2. The owner or his representative must be notified immediately by the committee in writing previous to the start of the race, in case it is found upon inspection that any rules have not been complied with.

3. In case it is found upon inspection that any of the rules have not been complied with the owner or his representative shall be granted the privilege of complying with the rules previous to the start of the race. The start shall not be delayed to permit this.

4. If in the judgment of the Race Committee any of the published rules have not been complied with previous to the start, as provided in Section 3, they may decline to permit the boat to start, except as hereinafter provided.

5. If upon inspection it is found that a boat is floating at a waterline lighter than her measured waterline the committee shall have the power to require a remeasurment either before or after the race, provided, however, that the committee inform the owner or his representative in writing previous to the start of the race of any such action they intend to take.

6. The committee shall *not* have the power to disqualify a boat for breach of any rule which would normally come under the head of Inspection unless the owner or his representative be informed in writing by the committee previous to the start of the race of their intention to disqualify, and provided the owner has failed to comply with such rules after having been so notified.

7. If in the judgment of the Race Committee a boat is unseaworthy, unsafe, or unmanageable or has failed to live up to the spirit or letter of the rules previous to the start of the race they may refuse to allow the boat to start, except as hereinafter provided.

8. In sanctioned races, after the owner or his representative has been notified in writing to comply with any rule, he (the owner or his representative) may file in writing with the local Race Committee a statement, previous to the start of any race, informing the committee of the owner's intention to appeal to the Racing Commission of the American Power-Boat Association from any of the decisions made under any of the above paragraphs of this rule, in which case the local Race Committee shall allow the boat to start in the sanctioned race and shall withhold announcing the results of the race until a hearing has been held by the Racing Commission of the American Power-Boat Association and a chance given to both sides to be heard. In case the Racing Commission rules that the appeal is justified then the performance of the boat shall be considered as official; but should the Racing Commission rule that the local Race Committee was justified in its action then the performance of the boat in the race shall be removed from the records.

9. In case any necessary expense is required in carrying out the terms of paragraph 8 they shall be borne in full by the loser.

Under the heading of revolutions of the motor the following new rule was adopted:

It shall be the duty of the owner (or an authorized and qualified representative) to take actual revolutions of motor with an approved revolution counter, and report same to the local Race Committee in writing immediately after the boat finishes.

The intervals at which revolutions shall be taken follow:

Under 25 miles not less than 15 nor more than 30 minutes
Over 25 Under 50 miles not less than 20 nor more than 30 minutes
Over 50 miles not less than 30 nor more than 60 minutes

Of the revolutions so reported, 25% showing the maximum shall be averaged and used as R.P.M. for computing horsepower of motor in section 5, Rule V.

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New Two-Cylinder Frisbie Motor

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The Reverse Gear is entirely enclosed, the lower half of the base extending under it, and, over it, placed a case, and, on that case, a cover. This cover is large, permitting ready access to the gear for adjustments. The Reverse Gear itself being installed between couplings is very accessible, and the whole Reverse Gear can be removed from the motor without dismantling the gear itself.

The rear bearing, aft of the reverse gear, is placed in the lower base, enclosed, and so arranged that any oil leaking through that rear bearing is automatically carried back to the reverse gear enclosure and not allowed to leak into the bilge of the boat itself.

The camshaft drive is rather unusual. At a point on the crankshaft, just aft of the rear cylinder, is installed a spiral gear, and that gear, running through another spiral gear, operates a cross shaft running across the back end of the upper base, and that cross shaft, through another set of spiral gears, operates the camshaft. The cross shaft is equipped with two thrust bearings, and the camshaft with two thrust bearings. These take up any thrust that is created in the camshaft drive. The camshaft bearing plates are so arranged in the upper base that they can be readily removed, after the large hand hole plates on the base are taken off, and then the whole camshaft can be removed bodily from the base itself.

The water pump is of the plunger type, being of slow speed, with very large capacity. To the end of the cross shaft in the upper base is installed a small gear operating, within the pump gear enclosure, a large gear to which is connected a small crankshaft; this crankshaft operating the pump itself. The inner face of this gear enclosure is left open; through corresponding openings on the side of the upper base the pump receives its lubrication for its driving gears and crankshaft.

All working parts of the motor with the exception of the flywheel have been enclosed. A cover fits over the valve actuating mechanism on the top of the cylinder, and another cover encloses the pushrods on the side. Each of these covers is held in place by one stud and one knurled nut, and the covers can be removed without the use of a screw driver or a pair of pliers.

It was important in the mind of the designers that this motor be absolutely clean in operation, and that it be one not only that would not throw oil, but also would not give out smoke into the

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Finding One's Way About in a Motor Boat

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When it is desired to go from Execution Rocks, lettered C to Porgy Shoal Light, lettered D; as in the case when the current was at right angles to the boat's course, we again connect the starting point C with the finishing point D by means of a line. We determine the distance between these two points from the scale of the chart and find it to be 5 miles. Now on CD or CD extended, we find a point K which is equal in distance from starting point C to an hour's run of the boat in still water, or in our case 8 miles. From C we draw a line CM which in direction is opposite to the direction of the flow of the current or in our case, east. Point M is located on this line at a distance from C equal to one hour's flow of the current or in our case two miles. We now draw a line from M parallel to CD and locate point J on it so that CJ will be equal to an hour's run of the boat in still water or 8 miles. The direction of CJ will be the course which must be steered and by transferring the direction of this line CJ to the compass rose we find this direction to be NE x E which is the course which must be steered to run from Execution Rocks to Porgy Shoal Light.

To calculate the time required to run from C to D under these conditions, we draw a line from J parallel to the current line CM which will meet the line CD extended at N. Now the distance of the line NK will represent the amount which the boat has been retarded by the current in one hour's running time in still water. By measuring this distance with a pair of dividers we find it to be equivalent to 1.6 miles. Therefore the speed of our boat over the bottom will be 8 minus 1.6 or 6.4 miles an hour. As the distance from C to D has been found to be 5 miles therefore the time required will be 5 divided by 6.4 or .78 hour which is equivalent to 47 minutes.

Another instance in oblique current sailing is where the current tends to favor the boat's progress through the water rather than to retard it as in the instance just described. But the method of procedure is the same.

For example, if it is desired to sail from point Q to V it is apparent that a westerly current will considerably assist the boat. To determine the course which must be steered we lay off from Q a line in an easterly direction equal in length to an hour's flow of the current, namely two miles. This gives us the line QS. We now draw a line from S which we will call SX parallel to QV but of an indefinite length. We determine a point on this line SX which represents the distance from Q equal to an hour's run of the boat through the water or in our case 8 miles. This gives us point T. A line is drawn from Q to T and its direction is found to be NW x W ½ W which is the direction which must be steered to make good the course of WNW between Q and V.

To find the time to hold this course in order to reach point V lay off a line from T parallel to the current line QS. This will intersect QV extended at Z. Locate a point Y on QV extended so that the length QY will represent one hour's sailing of the boat under normal conditions in still water, that is 8 miles. Then YZ will represent the amount which the boat has been aided by the current in one hour. Therefore the speed of the boat over the bottom will be QY plus YZ or 8 plus 1.7 which is equal to 9.7 miles. As point V is 7.3 miles from Q the time required to cover this distance QV will be 7.3 divided by 9.7 or .75 hour or 45 minutes.

The following, whose papers were received during October, have passed:

Lesson No. 1: D. E. Graham, Kenneth Gess.

Lesson No. 2: D. E. Graham, Kenneth Gess, J. P. Hallenbeck.

Lesson No. 3: A. C. Des Brisey, L. H. Chapman, Ed. L. Curbishley, Kurt Roenitz, Ward Thomas.

Lesson No. 4: L. H. Chapman, H. Greinert, Fred Klink, John Lang, Walter Slocum, Arch Smith, Thomas Steinger.

Lesson No. 5: Seymour Bradley, John Brodhead, J. Calvert, L. F. Chapman, L. L. Crosthwaith, E. Donkin, J. A. Howland, J. W. Lough, Geo. D. McCluskey, Harry Quick, Thomas Steinger, Fred Scadden.

Lesson No. 6 and 7

W. A. Baxter-Gould, Henrich Boche, W. G. Boyden, Charles B. Downs, Arthur Ek, Albert J. Fenton, Paul C. Gurney, W. C. Gustafson, Edwin Halliday, Charles Houlroyd, Carl Holzkamp, J. A. Howland, Mrs. E. G. Kaiser, Geo. R. Law, Jr., J. F. Lowcock, L. McKenzie, H. A. Morton, Dr. P. D. MacSween, Donald C. McClean, George D. McCluskey, Edward Mathews, Harry Quick, Geo. A. Rawson, Jos. Reinhardt, Merle B. Ross, Fred Scadden, Geo. H. Thurston.

Lesson No. 8

R. Andren, W. A. Baxter-Gould, Percy Benedict, Dr. A. B. Bennett, Jos. Bister, Henrich Boche, W. G. Boyden, Henry Byers, H. R. Broll, Chas. Burch, Dr. F. G. Brown, Michael Cibener, W. A. Cornell, Clarence W. Culver, W. W. Dickson, W. J. Gorton, Charles E. Grush, W. S. Gustafson, Paul C. Gurney, J. A. Hain, George Hansen, Chas. Houlroyd, J. Edwin Jones, Mrs. E. G. Kaiser, C. M. Labunski, George R. Law, Jr., George H. Leland, J. F. Lowcock, W. B. Landreth, Geo. D. McCluskey, Ed. Mathews, L. McKenzie, Frank Mitchell, W. B. Moores, H. A. Morton, John Reichester, Jos. Reinhardt, W. S. Roedel, Edmund Roxby, Dr. J. F. Schifcik, Barbara P. Smith, H. R. Stiles, Miss S. Steinmetz, Otto A. Thomas, J. Dunbaugh, Arthur Ek, I. S. Ellsworth, Percy Edwards, Albert J. Fenton, Vincent Francis.

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Finding One's Way About in a Motor Boat

(*Continued from page* 86)

When it is desired to go from Execution Rocks, lettered C to Porgy Shoal Light, lettered D; as in the case when the current was at right angles to the boat's course, we again connect the starting point C with the finishing point D by means of a line. We determine the distance between these two points from the scale of the chart and find it to be 5 miles. Now on CD or CD extended, we find a point K which is equal in distance from starting point C to an hour's run of the boat in still water, or in our case 8 miles. From C we draw a line CM which in direction is opposite to the direction of the flow of the current or in our case, east. Point M is located on this line at a distance from C equal to one hour's flow of the current or in our case two miles. We now draw a line from M parallel to CD and locate point J on it so that CJ will be equal to an hour's run of the boat in still water or 8 miles. The direction of CJ will be the course which must be steered and by transferring the direction of this line CJ to the compass rose we find this direction to be NE x E which is the course which must be steered to run from Execution Rocks to Porgy Shoal Light.

To calculate the time required to run from C to D under these conditions, we draw a line from J parallel to the current line CM which will meet the line CD extended at N. Now the distance of the line NK will represent the amount which the boat has been retarded by the current in one hour's running time in still water. By measuring this distance with a pair of dividers we find it to be equivalent to 1.6 miles. Therefore the speed of our boat over the bottom will be 8 minus 1.6 or 6.4 miles an hour. As the distance from C to D has been found to be 5 miles therefore the time required will be 5 divided by 6.4 or .78 hour which is equivalent to 47 minutes.

Another instance in oblique current sailing is where the current tends to favor the boat's progress through the water rather than to retard it as in the instance just described. But the method of procedure is the same.

For example, if it is desired to sail from point Q to V it is apparent that a westerly current will considerably assist the boat. To determine the course which must be steered we lay off from Q a line in an easterly direction equal in length to an hour's flow of the current, namely two miles. This gives us the line QS. We now draw a line from S which we will call SX parallel to QV but of an indefinite length. We determine a point on this line SX which represents the distance from Q equal to an hour's run of the boat through the water or in our case 8 miles. This gives us point T. A line is drawn from Q to T and its direction is found to be NW x W ½ W which is the direction which must be steered to make good the course of WNW between Q and V.

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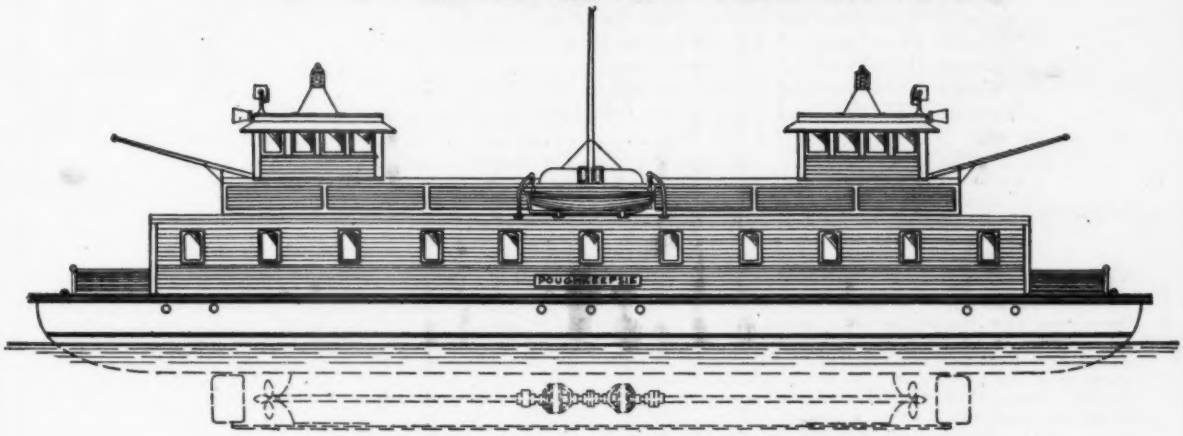
Winton



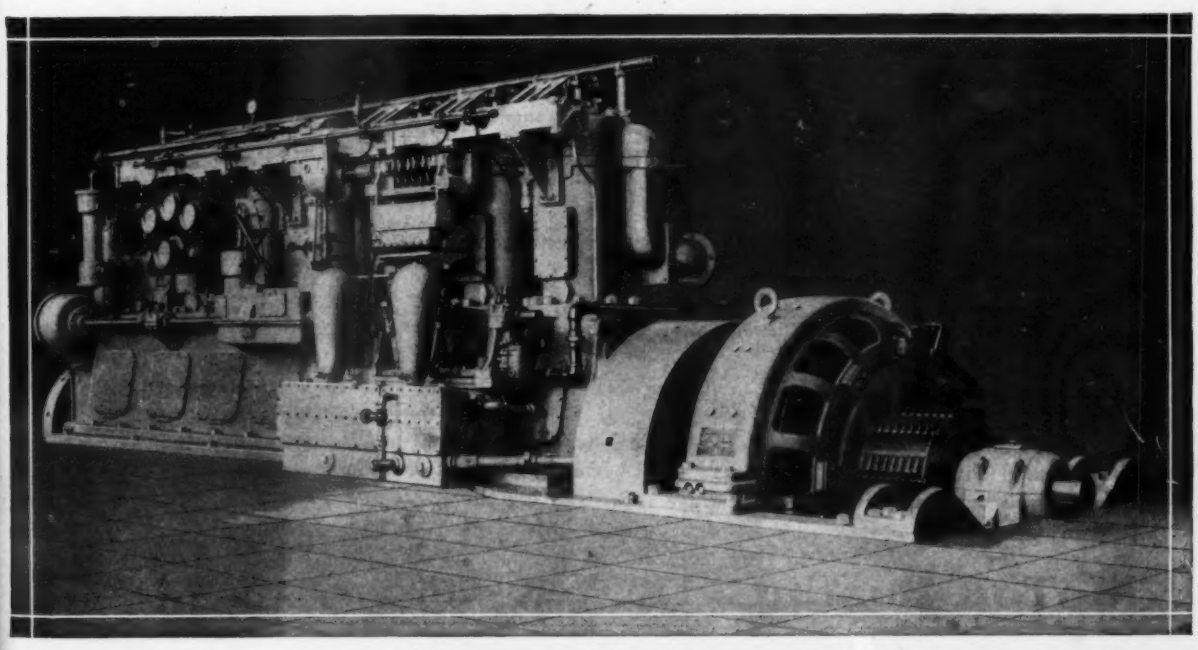
A Diesel-Electric Drive Ferry Boat

THE Ferry-Vessel "Poughkeepsie" now under construction at the Atlantic-Gulf & Pacific Company's Yard, Brooklyn, N. Y., for the Poughkeepsie and Highland Ferry Company is 140′ over guards, 137′ 6″ over-all, 52′ breadth over guards. Designs by C. V. S. Wyckoff.

Power plant consists of a pair of six cylinder 150 H.P. Winton Oil Engines direct connected to 90 K.W. Westinghouse Generators, which in turn operate two 100 H.P. Westinghouse electric motors on the double-ended propeller shaft. Capacity for 32 automobiles, in addition to usual cabin facilities.

WINTON DIESEL ELECTRIC DRIVE IS **THE** MODERN POWER PLANT

WINTON ENGINE WORKS **Cleveland, Ohio**



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New Two-Cylinder Frisbie Motor

(*Continued from page* 118)

engine room or cabin of the boat. It was found most of the smoke from other motors comes through around the valve stems and from the burning of the oil on the cylinder head. To get rid of this burning of oil there have been adopted self-lubricating graphite bushings, that require no oil. While these are new to the marine engine industry, still they have been used successfully in other lines of automotive apparatus for years. One of these self-lubricating bushings is installed on the main rocker arm shaft and another on the shaft equalizer.

Consideration of these general details of design and engineering will be the proof of the thought that has been put into the design of this motor. The fact of real importance, though, is of course, what the motor does in operation. In the first place, this is a low compression motor, which has a compression of sixty pounds or less, giving longer life to the bearings, and is moreover of a medium speed type and is of the 2 cylinder 4 cycle design. Running at 600 r.p.m. the motor delivered on the test at the factory 23½ H. P. and it showed a fuel consumption of from .57 to .58 pounds per horsepower hour. Its flexibility and smoothness of operation are indeed surprising to those who have seen other 2 cylinder 4 cycle engines run. The tests in the factory were held for a period of over seven months and were accurately made on a Sprague electric dynamometer.

One of these motors is installed in a 28' cruiser in Providence, R. I. Operating at 595 r.p.m. one gallon of gasoline ran the motor for over twenty-seven minutes, and at 495 r.p.m. one gallon of gasoline ran the motor for about thirty-two and a half minutes. This economy is of course very surprising and probably creates a record in this type of motor.

The oil consumption of the motor is still more remarkable. In the case of the boat installation just referred to the motor went on a trip for fishing and towing, operating a period of thirty hours. In the thirty hours of operation only one and a half quarts of cylinder oil were used.

Accessibility and strength have been two ever important factors in the design of this new model. The crankshaft is of large diameter with very large bearings, and moreover has a bearing between every throw of the crank. Bearings are all adjustable and readily replaced. Very large factors of safety have been employed everywhere in the design. The weight of the motor will not figure much higher per horsepower than other motors in the Frisbie line, and the motor will not be found to be any heavier than the motors of like power of other makes. The exact weight of the motor, equipped with reverse gear is 1315 pounds.

The field for this motor will come in commercial boats used in fishing, towing, etc., from 27 to 35 feet in length, for pleasure boats, open launches, and cruisers, heavily constructed of those same dimensions and also for use as a power plant in sailing crafts. It would prove to be a very desirable installation in the small schooners now coming from the boards of the more prominent architects and proof of its popularity is shown by the fact that even before the motor was advertised, anything spoken about them, several orders were placed with the Frisbie Motor Company, for the motors, without the customers knowing the details of the engine, price to be asked, its power, etc.

The 2 cylinder motor is simply the first of the full line of this same design of motors. There will follow shortly the 4 cylinder, 50 H. P. motor at 600 r.p.m., the 4 cylinder 100 H. P. at 1100 r.p.m., and the 6 cylinder 150 H. P. at 1100 r.p.m. The motor is not supplanting anything in the present Frisbie line and that company has no intention of discontinuing any of its present motors. This new model is an added number to take care of another class of work, a class for which was felt no engine heretofore had been created. Literature is available on this motor, and can be had for the asking.

Divers Experiences

(*Continued from page* 110)

those accorded us by Captain Johnson and his fellows of the sea, it was still more pleasing to be privileged to mention them in print. And this installment of Hippo's cruise story cannot conclude without representation of our interview at the offices of the United Fruit Company when we called to pay our hauling-out bill.

"We've come," said Al, "to find out what we owe you for hauling us out last Saturday.'

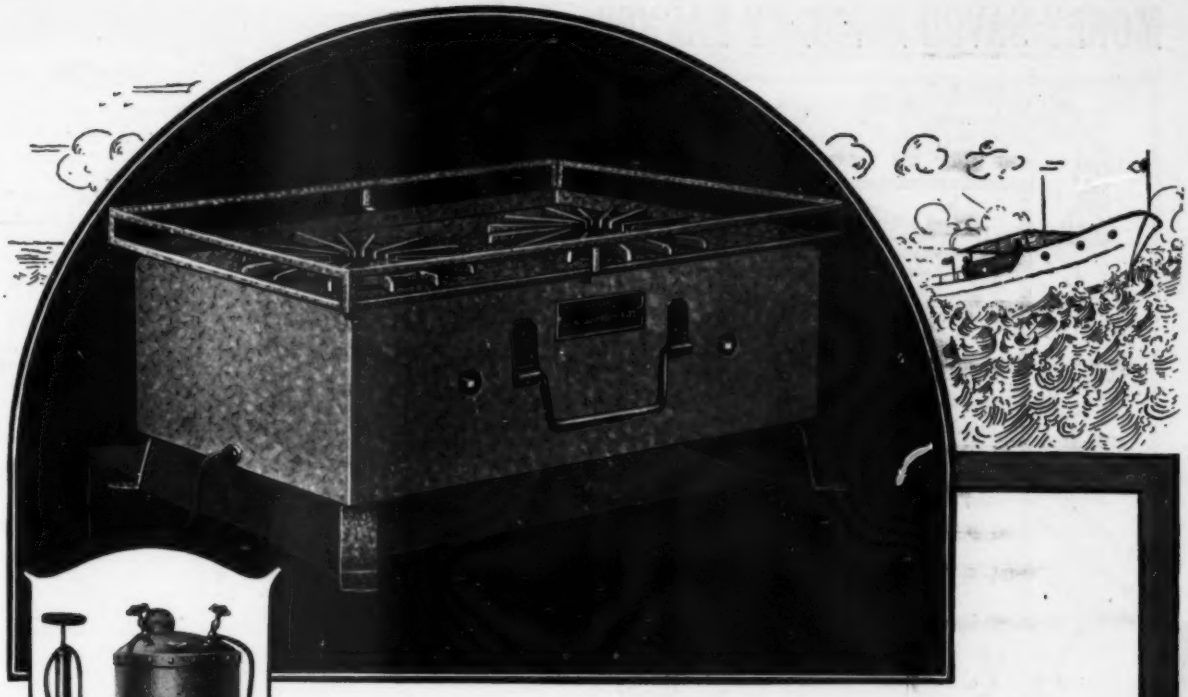
"Did we haul you out?" asked the manager. "I'd forgotten."

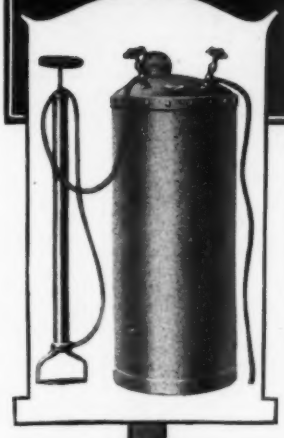
"You certainly did, and you'd better take our money while we have it."

"Well, let me see. You've come a long way and you may never get to where you're going, and the cost will be—nothing."

They may have hurricanes in the tropics—though you've yet to see one—and sharks, and all manner of predatory influence. But the hearts of the inhabitants are in the right place.

Advertising Index will be found on page 138





Install

GALLEY Auto KOOK KIT
TRADE MARK

NOW

NOTE

Auto-Galley-Kook-Kit can also be had with a one gallon tank and smaller pump if desired. Other equipment same as described.

Price $27.50

For those wanting a more compact unit, Auto-Galley-Kook-Kit is made with a small two quart tank attached to the end of the stove. Other equipment is the same as described.

Price $20.00

Special stoves made to order with any number of burners. Send a blue print of your galley and we will gladly submit an estimate.

Auto-Galley-Kook-Kit can be finished in a rich black or dark brown enamel over the galvanized finish if desired at an additional cost of 50c.

Be equipped to serve real home cooked meals on board at any time. Make cooking a pleasure instead of a hardship.

Auto-Galley-Kook-Kit burns motor gasoline—gives a steady hot blue flame that a thirty mile wind will not blow out. The gas tank holds three gallons and can be mounted outside the galley if desired. Stove measures 20¼" x 10½" x 5⅛"; legs are 2" high; body is made of heavy galvanized iron, strongly riveted; all fittings are either galvanized or of copper or brass. Pump is made of polished brass, 1¼" x 20". Each stove is equipped with a full sheet of galvanized iron, slotted to receive stove legs, and which will serve as a covering for the table or bench upon which the stove is mounted.

Auto-Galley-Kook-Kit has been tested under all conditions and has proven to be the most satisfactory galley stove on the market.

Price complete with pump, tank, and 15 feet of flexible copper feed pipe, $35.00.

Specify Auto-Galley-Kook-Kit on your new boat. Write or wire today for details.

Made by the makers of the famous

KAMP Auto KOOK KITS

PRENTISS-WABERS STOVE CO.

General Offices and Factory:
108 Spring St.,
Wisconsin Rapids, Wis.

Export Offices:
1416 Broadway,
New York City,
U. S. A.

Yard and Shop

(*Continued from page 59*)

for either steel or woodwork in the United States. Eastern yachtsmen who contemplate building a new boat should not fail to investigate the facilities of this plant. A new complete catalogue of thei rvarious boats is in preparation and will be ready for distribution during the winter.

Jiffy Jumper

A novel overall device made of olive drab duck which can be affixed snugly about the body of the wearer by means of flexible steel bands is something every motor boat mechanic should have. The device can be quickly put on and taken off and will protect the garments of the wearer from all engine grease and other dirt. It is made in one size only and will fit any size person.

Does Your Boat Leak?

For the particular repair of leaky boats, the L. W. Ferdinand Company of Boston, Mass., manufacture several grades of marine glue which is very effective in stopping leaks. It is applied like paint while hot along the seams on the inside of the hull and effectively seals the leak. If this method is not sufficient their instruction booklet tells of many other ways in which this work can surely be accomplished.

Caille Sales Force Increased

Harry S. Masoner, formerly manager for a large sporting goods house in Cleveland, is now associated with the Sales Department of the Caille Perfection Motor Company. He has been closely affiliated with this field for several years and is an especially skillful and enthusiastic fisherman and thoroughly familiar with all kinds of conditions of fishing. As most users of rowboat motors are fisherman his knowledge and suggestions will be valuable.

Stock Boats for 1922

(*Continued from page 57*)

Lgth. Feet	Trade Name	Type	Beam Feet	Draft Feet	H.P.	R P M	Prop. Ins.	Speed m p h
32	Richardson	Cruiser	9-0	3-0	20	600	22	10
32	Harrison	Cruiser	8-6	2-10	40	.....	.....	12
32	International	Raised Deck Cruiser	9-0	3-0	20	750	20x18	10
33	Elco	Cruisette	8-8	2-10	40	900	.....	12
33	Washington	Cruiser	8-9	2-6	30	1000	20	16
34	Cuthbert	Cruiser	8-6	2-4	100	.....	22	22
35	Dean	Cabin	9-10	2-10	.....	.....	.....	.....
35	Washington	Fishing Type	9-3	4-6	16	400	28	9½
35	Washington	Cruiser	9-3	4-6	16	500	28	12
35	Pyke	Runabout	7-0	.....	225	.....	.....	38
35	Racine	Runabout	6-0	1-3	200	.....	.....	38
35	Ramaley	Runabout	7-6	1-6	200	1600	18x31	40
35	Seabright	Dory	10-0	2-0	40	1000	22x22	10
35	Seabright	Cruiser	10-6	2-0	40	1200	22x18	12
35	Racine	Runabout	6-0	26	200	.....	.....	40
36	Albany	Cruiser	9-0	2-6	100	.....	22x26	15
36	Elco	Express	6-6	2-5	225	1500	.....	32
36	Burger	Bridge Deck	9-0	3-0	32	750	22x18	11
36	Luders	Cruiser	9-0	3-0	18	600	.....	10
36-5½	Densmore	Cruiser	9-6	2-6	50	1000	.....	16
39-6	Racine	Cruiser	9-6	2-6	40	.....	.....	12
40	Washington	Cruiser	9-8	2-10	90	1000	24	24
40	Rochester	Cruiser	9-6	2-9	100	.....	.....	15
40	Richardson	V-Bottom Cruiser	9-6	3-0	25	600	22	10
42	Great Lakes	Express Cruiser	10-0	2-10	225	1600	.....	24
42-6	Albany	Cruiser	10-6	2-6	140	.....	22x30	19
45	Washington	Fishing Type	1-6	4-6	20	400	34	10½
45	Rochester	Cruiser	1 9-6	2-9	150	.....	.....	18
50	Albany	Cruiser	11-0	2-6	280	.....	.....	22
50	Elco	Cruiser	10-4	3-5	75	625	.....	13
54	Great Lakes	Express Cruiser	11-0	3-6	300	1400	22x24	25
60	Luders	Twin-Screw Cruiser	12-0	3-3	100	600	.....	14
73	Densmore	Cruiser	12-9	4-0	300	1000	.....	18

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The New Model "T" 20 H. P. Frisbie

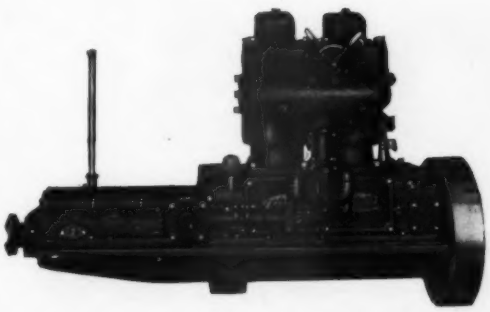
THE Model "T" adds a new size to the popular Frisbie line—2 cylinder, 4 cycle, 20 H.P. 6" bore and 6" stroke.

Like all Frisbie Motors, the Model "T" has all the valves in the cylinder heads, opening directly into the combustion chambers; only in the Model "T" there are *four valves* to each cylinder instead of two, and instead of being set in removable cages they are *set in detachable heads.* The entire cylinder head can be removed without taking off either exhaust or intake pipes, spark plug or other connections.

Besides the greater accessibility thus arrived at, this makes possible the combination of a *hot spot manifold;* and it is to these two points, the four valves in the cylinder head and the hot spot manifold, that a large share of the remarkable efficiency of the Model "T" is due.

On repeated tests, under actual working conditions, this new "Friendly" Frisbie has shown 23½ H.P. at 600 r.p.m. On economy tests it ran 27 minutes on one gallon of gasoline at 595 r.p.m., and 32½ minutes on a gallon at 495 r.p.m. It used only about 1½ quarts of oil in 30 hours of towing, fishing, etc. The motor is absolutely cleanly in operation and devoid of vibration.

Write for full details.



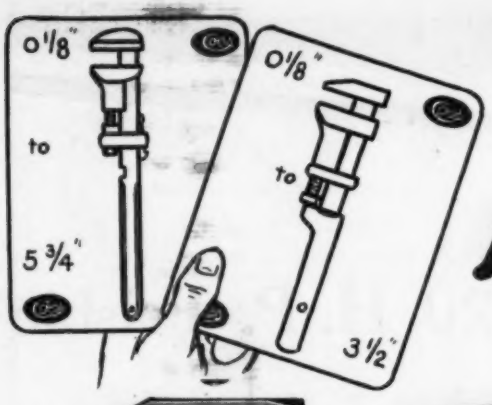
Model "T" the New "Friendly" Frisbie

2 cylinder, 4 cycle, 20 H.P. 6" Bore and 6" Stroke. A Motor of exceptional strength, reliability and efficiency.

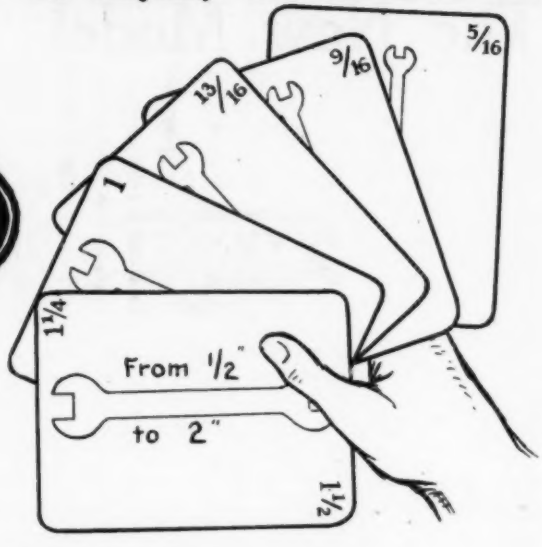
Frisbie Motor Company

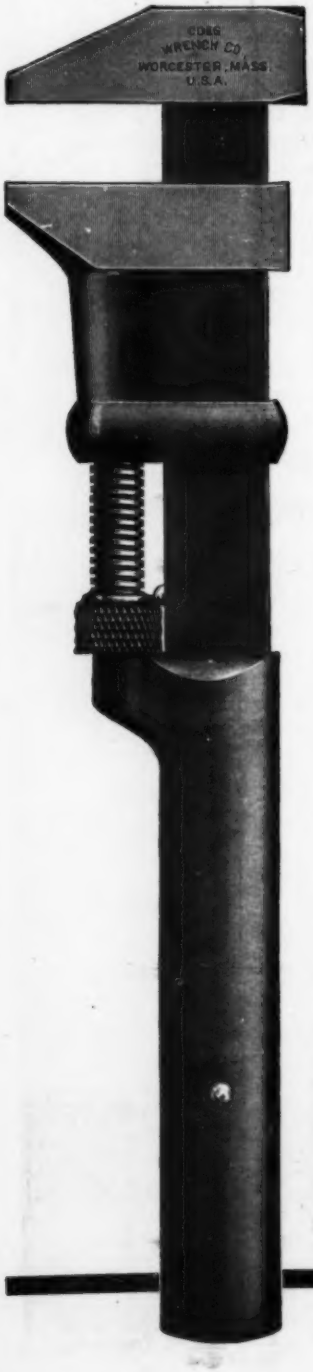
7 COLLEGE ST.

MIDDLETOWN, CONN.



THIS PAIR *BEATS* A FULL HOUSE





TRADE MARK REG. U.S. PAT. OFF. No. 84046

Coes

COES WRENCHES

Next time you have to crawl out from under and get one more open-ender, remember this, A COES Wrench always fits, it always holds, and one of them will fit more assorted nuts than a double-handful of open-enders.

Ask Your Dealer

COES WRENCH COMPANY
WORCESTER, MASS.

Advertising Index will be found on page 138

Mud Turtle, a Novel Stern Paddle Wheel Cruiser

(*Continued from page* 48)

Engine Foundations: White oak 3-inch bed logs to be fastened to 3-inch oak floor timbers by ⅜-inch galvanized drift bolts. Floor timbers fastened to keel by two ⅜-inch galvanized drift bolts and nailed to frames from the frame side. Limbers to be provided in floor timbers. Engine bed to suit exact dimensions of the engine installed; bed shown on plan is not drawn to suit any particular motor.

Cockpit: Floor beams to be oak 1½ by 2 inches. Decking or floor to be ¾ by 3 inches white pine painted. Flush hatch same construction as cockpit floor. Box over motor to be built to suit size of latter. Cockpit floor to extend to opening between beams. On this will be fastened rabbetted sill 1 by 1½ inches and at corner posts to be fitted, fastened to sides of boxing so as to remove with boxing. Sides to be ¾-inch tongued, grooved and V-d oak or cypress fastened to 1½ by 1½-inch piece resting on rabbetted sill (this piece not shown on plan) and entire box held down tight in position by brass hooks so that box may be easily removed. Top to have 1½ by 2-inch framing with ⅞-inch cover to remove by lifting off.

Cabin House: At positions shown between windows oak or yellow pine studs 1½ by 2 inches to be fastened to shelf and at bottom of stud. At corners rabbetted oak corner pieces to be fastened by galvanized rods driven from top through deck frame and secured under same by nuts and washer or riveted. Over tops of studs a yellow pine plate 1 by 1½ inches to be fastened and at each corner of house aft and close to rabbetted corner pieces at forward end a galvanized ¾-inch tie rod to be fitted from top of plate to deck frame. Between windows inside and outside ½-inch oak, cypress, or mahogany to be secured in place. If cabin finish is mahogany the corner pieces will be mahogany instead of oak as above specified. Windows to be ⅞-inch glazed with double diamond glass, to be provided with Pullman sash balances and flush handle for raising and lowering, window to drop into pocket below window sill level. Running between studs and secured to deck is to be rabbetted sill 1¼ by 2 inches to take outer sheathing in rabbet and below windows canvas is to be tacked and laid in thick white lead on top of this sill and turned up against inner sheathing to make seam tight and prevent rainwater driving in by window sash and running down inner seam into cabin. To effect this the outer sheathing or coaming will be fastened last. Window sills to be ¾ by 3 inches extending between studs and slotted for windows to pass through. To produce the effect of a continuous sill there is to be a ¾-inch molding fitted between windows in line with window sills. At top inside and outside a ⅜-inch covering piece to be fastened and outside a 1-inch half-round. Cabin top beams to be 1 by 1¾ inches steam bent to crown and fastened to plates. Cabin top to be ⅝-inch tongued, grooved, and V-d one side (under) white pine or spruce or cypress nailed to beams and covered with 8-oz. canvas laid in thick wet white lead paint, edges turned over at cabin sides and fastened, being covered by covering piece and half-round. All windows to be straight, none curved.

Bulkheads: Bulkheads to be ½-inch tongued, grooved and V-d two sides mahogany, cypress or oak according to finish selected.

Companionway: Door to be ⅞-inch oak or mahognay stiles and rails with ⅜-inch panels, hung with 2 by 2-inch fast pin bronze butt hinges and provided with bronze rim ships lock set. Sill 1⅛-inch with rabbet for door, casing to be ¾-inch, companionway coaming or runs to be 1 inch, slide ¾-inch pine covered with canvas and painted same as cabin top, slide framing to have ends slide in groove on inner sides of runs. Canvas on cabin top to turn up at companionway and be fastened on inner side of runs or coaming and covered by ⅜-inch covering pieces.

Steering Gear: A 24-inch steering wheel to be mounted with drum or chain and sprocket gear on bulkhead and 5/16-inch galvanized flexible tiller rope to be led along port side in back of removable sheathing through galvanized sheaves and fairleaders to end of 15-inch galvanized tiller on port rudder; tillers to be connected by 1 inch by ½ inch iron rod with bolt at each tiller so that free motion is permitted; tiller rope to be attached to end of starboard tiller, led through sheave, thence across boat, through sheave and forward to another sheave, thence to steering wheel. Rudders to be oak 1 inch thick hung on the transom by bronze rudder strap braces. Edges neatly rounded.

Cockpit Coaming: To be ¾-inch oak or cypress or mahogany board in one width securely screwed to deck and shelf, lower edge being just below bottom of shelf. Below this coaming ⅜-inch tongued, grooved and V-d one side cypress, oak, or mahogany sheathing to be fastened to filling piece below shelf and to rabbetted sill on cockpit floor. Seam to be covered by 1-inch half-round to suit finish. On the port side this sheathing to be secured to nailing strips and the whole section of sheathing

(*Continued on page* 136)

Advertising Index will be found on page 138

Again—Genuine Imported Insulators in

RAJAH SPARK PLUGS

LIKE many other commodities during the war, genuine imported insulators for spark plugs became nothing but a fond memory for the American motor user. But one of the blessings of peace is the return of these superlatively efficient insulators in Rajah Spark Plugs.

The imported Rajah Insulators will not crack from heat. Their dense hard structure resists electrical leakage to the maximum and thus always insures a hotter spark, better ignition and a smoother running motor. The wonderful glaze resists the effects of oil and carbon and is not affected by even the hottest temperatures found in present day motors.

Heatproof, leakproof, oil-proof, and carbon-proof in the highest degree, the imported insulator is just one more point of preference for the man who has learned to use nothing but Rajah Plugs—the plugs that make **ignition absolutely sure.**

Rajah Spark Plugs with Genuine Imported Insulators.
Standard (all threads) $1.25; Giant (all threads) $1.50.

If your dealer does not have genuine Rajah Plugs and Terminals, send us his name, tell us the size you want, and we will see that you are supplied, postpaid. If you are not sure of the size, tell us the name of your engine.

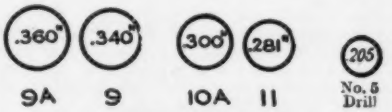
RAJAH SOLDERLESS TERMINALS

(Actual size)

Thrust Clip | Hook Clip | Ring Primary | Assembly to Cable

A brand new style Rajah Terminal that can be attached to the cable **in ten seconds,** without tools or solder. Simply strip insulation back 3/16", insert wire in ferrule, and screw down the pointed part as shown. The wire is gripped like a vise, giving a perfect electrical connection that cannot pull out or shake loose, but can be removed in a jiffy.

If your dealer hasn't stocked this terminal yet, send us his name with 15 cents for a sample. Or order enough to equip all your spark plug wires, stating sizes and types wanted.



Standard Cable Sizes:
5 M.M., 196 7 M.M., 275 9 M.M., 354

These are the celebrated Standard Rajah Terminals

Thumb Nut — with all Rajah plugs unless Ball or Stud type preferred

Regular Fits any size cable

Thrust Furnished with ferrules to fit any size cable

Hook

Primary Ferrules to fit cables up to ⅛"

Keeps connections dry Protects against shocks Fits any plug or coil

Manufactured by

Rajah Auto Supply Co. Bloomfield, N. J., U. S. A.

Mud Turtle, a Novel Stern Paddle Wheel Cruiser

(*Continued from page* 134)

to be fastened by a few screws (round-headed) so that sheathing can be readily removed for access to steering gear.

Fuel Tanks, Etc.: Under the forward deck are to be fitted two fuel tanks made of No. 18 hard copper with carefully brazed seams, each tank set in copper pan provided with scupper overboard. Each tank to have vent, 1½-inch filling pipe threaded into brass deck plate and into bushing on tank, with outlet with gasoline cock and strainer.

Equipment: Two closed bow chocks fitted in chock rail. Flagpole sockets bow and stern with flagpoles and halyards. One 2½-inch galvanized chain deck pipe with box built under leading rope to locker. One dozen brass cup hooks. One-half dozen brass coat and hat hooks. One 8-foot boat hook. One 8-inch fog-bell. One fog-horn. One whistle of owner's selection. Awning complete built of ½-inch galvanized pipe set in sockets, each bow frame in one piece, bent at top each side, ½ by 2-inch spruce battens riveted to frames and covered with 10-oz. waterproof khaki duck with grommets fitting awning fasteners along edges, front and rear and side curtains complete. Celluloid windows in front and rear curtains. Rail around cockpit ½-inch galvanized pipe set in sockets. Three size No. 11 galvanized bitts. American Yacht ensign 2 ft. by 3 ft. Two ¾-inch manila docking lines. One 50-pound anchor to best suit anchorage conditions as to type with necessary length to suit cruising ground of 2¼-inch circumference manila rope. Six life preservers or more. One fire extinguisher. One 3-inch liquid compass mounted in binnacle as per plan. Set of oil burning and anchor lights. One two-burner stove of owner's selection. Portable, folding dining table. Two copies of Pilot Rules. Water closet of owner's selection (bow type recommended because of economy of space) properly installed in toilet room. Enameled iron 15-inch corner lavatory with basin pump connected with water tank. Ten-gallon cylindrical fresh water tank installed in pine chocks under cockpit floor and provided with vent, filling pipe, outlet with shut-off, ½-inch galvanized piping led to galley pump and basin pump. Galley pump 2-inch size mounted on bulkhead over 12-inch by 18-inch enameled iron sink. Drains from lavatory and sink to enter same outlet through hull, this to be fitted with valve. Cushions filled with kapoc, covered to suit owner.

Stern Paddle and Wheel Drive: Engine is to be mounted on oak beds in position shown and aft of engine is to be installed a one-way clutch sufficiently large to handle the power transmitted. The controlling lever for this clutch is to be fitted with a rod led forward to a drop handle controlling the action of this lever, so that the clutch may be thrown in or out by the helmsman to enable the engine to be run without turning the paddle wheel or to relieve the paddle wheel of load in case the boat suddenly takes ground by disconnecting the engine from the paddle wheel. If there were no way of relieving the wheel of the load damage would be done the wheel or driving gear.

Keyed to the aft end of the shaft aft of the one-way clutch is a sprocket with ball-bearing thrust block each side secured to oak blocks fastened to hull. Diameter of this sprocket and of sprocket immediately above depends upon speed of engine installed. Upper sprocket to be keyed to shaft driving worm-gear operating paddle wheel. Forward of sprocket ball-bearing thrust block to be mounted on beam extending across boat. Chain to fit sprockets to be fitted to same and enclosed in casing which can be filled with grease (casing not shown on plan). Oak block to be fastened to transom and bronze stuffing box of flexible type to be fitted as indicated.

Oak outer bearers 2 inches thick and of depth shown on plan to be securely fitted, extending from bulkhead forward of engine to just beyond aft end of paddles. At forward end to be fitted into oak block secured to bulkhead, to pass through opening in transom, made watertight, and through oak block on inside of transom. Connecting ends of bearers oak piece 2 inches by 4 inches to be fitted. At paddle axle bearings oak piece to be fitted to inner side of bearer. Bearing with grease cup to be fitted at each end of axle, which is to be 2 inches diameter. Center bearer to be 3 inch oak of depth shown securely fastened through oak block fitted to inner side of transom and to have oak pieces on sides of bearer to take two ball-bearing thrust blocks and worm-gear.

Two paddle wheels to be keyed to axle, these being arranged so that one enters the water a few inches ahead of the other. Arms of paddle wheels to be oak 1½ inches square riveted to ¼ inch thick iron circular plate 12 inches diameter secured to hub keyed to axle. At inner ends of paddle buckets a ¼ inch by 1 inch iron hoop to be riveted to arms for reinforcement. Buckets to be oak ¾ inch thick by 8 inches by about 2 ft. 7 in. bolted to arms by 5/16 inch bolts.

Shield or cover of 1½ inch by 1½ inch oak framing with ⅜ inch covering to be built as indicated. Removable section to be provided in same for access to gear.

From end of both outer bearers and from end of center bearer to eye bolts secured in deck frame at transom top ¼ inch diameter galvanized iron rods with turn-buckles fitted for taking up slack shall be provided to help relieve bearers of strain.

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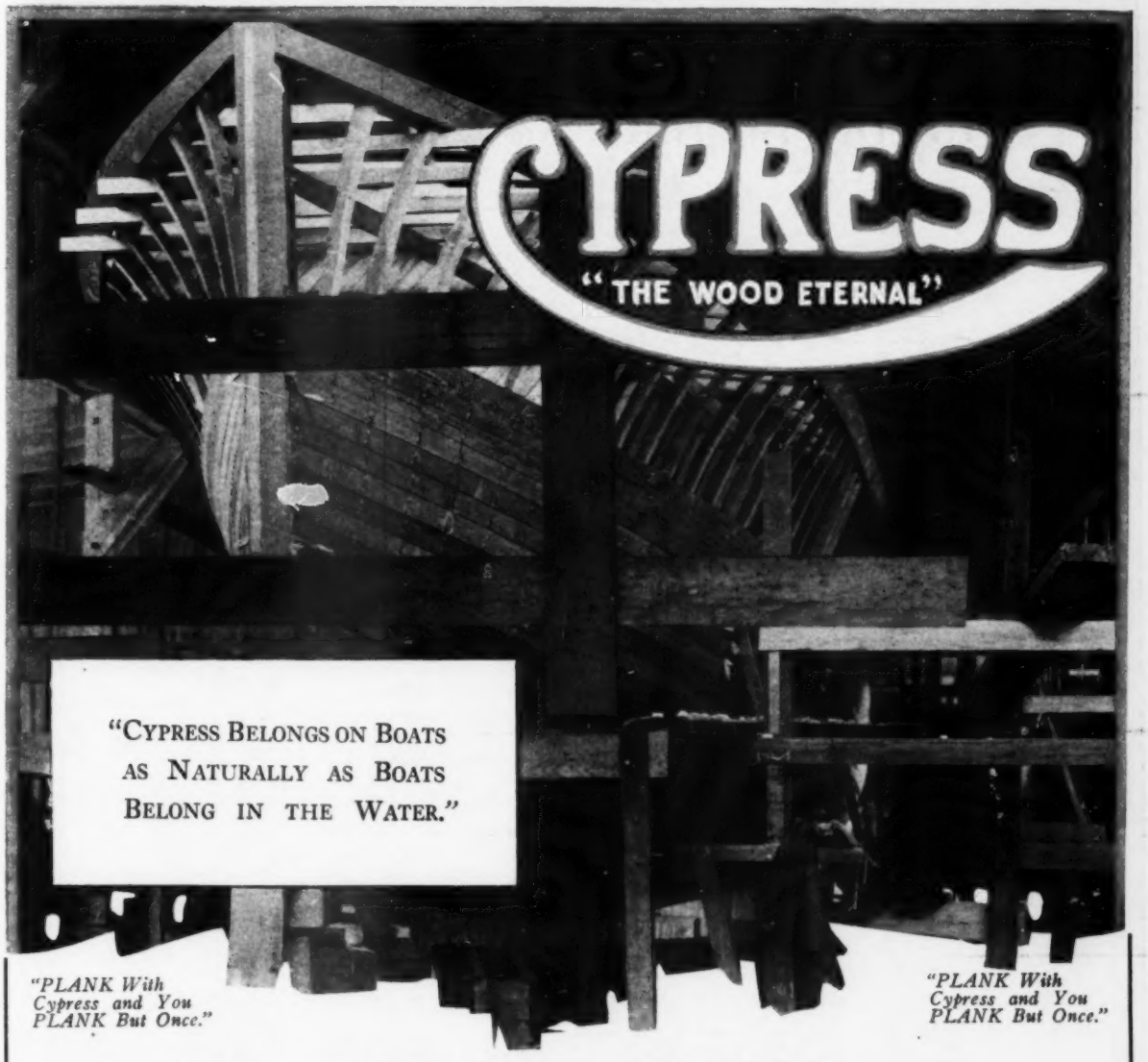


"Young Mariners Should Learn What All Old Mariners Know"

namely

Cypress is probably less affected by the action of water than any other wood.
(It was born and raised in water.)

All-heart Cypress practically refuses to rot, below the water line, or above it, or betwixt-and-between, where air and water meet and overlap perpetually.

(It's the wet-and-dry action that plays the deuce with most woods. "Cypress is in a class by itself," say boatmen who know.)

Cypress boats don't need replanking in a lifetime or two.

Why not avoid the ticklish and expensive job of replanking by using "The Wood Eternal" at first?

Volume 19 of the world-famous Cypress Pocket Library contains a lot more Cypress information for men who build, drive or sail boats—Chock full of charts and pictures, too.

A request will bring a copy with our compliments. Address

Southern Cypress Manufacturers' Association

1317 Poydras Bldg., New Orleans, La., or 1317 Heard National Bank Bldg., Jacksonville, Fla.

GENUINE "TIDEWATER" CYPRESS IS TRADE-MARKED WITH THIS "ARROW"
GET IT FROM YOUR LOCAL LUMBER DEALER. IF HE HASN'T IT, LET US KNOW IMMEDIATELY.

MoToR BoatinG Advertising Index

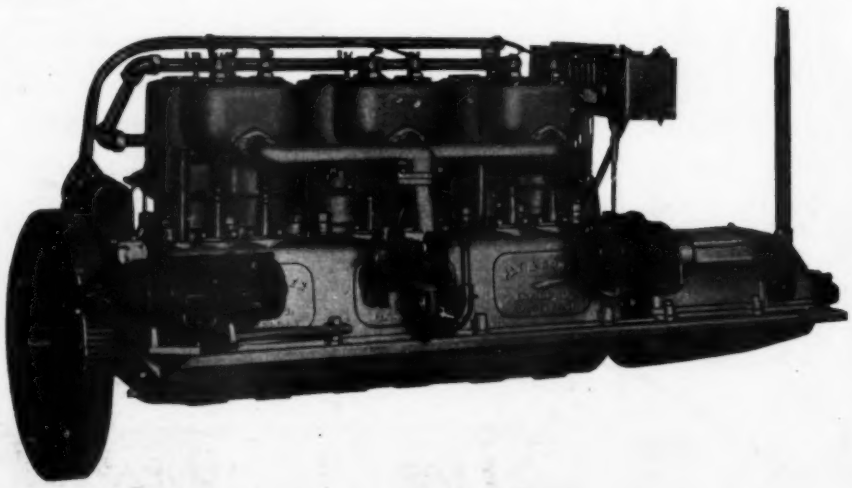
That "FEELING OF SECURITY"

(and he says two full seasons!)

VANETTA, a 40-ft. Cabin Cruiser, Powered with a Fay & Bowen L-64

MR. VAN COURT CARWITHEN of 300 Chestnut St., Philadelphia, is the owner of VANETTA. In a letter to us dated Sept. 21st, 1921, Mr. Carwithen says:—

"I am enclosing you a picture of the Vanetta, a 40-ft. cabin cruiser equipped with one of your L-64 engines. This engine has now been in operation for **two full seasons** and I am glad to say that it has never been necessary for me to make one single adjustment to the engine, nor during that time have I ever had one particle of trouble. It has been a great source of pleasure for me to drive the boat with this engine in it, and the **feeling of security** that your boat is always going to do exactly what you ask it to do, is one that makes boating indeed a pleasure."



Model L-64. 6-cyl. 5 x 6¼ with electric starter

RELIABILITY F&B

FAY & BOWEN ENGINE COMPANY

104 LAKE STREET, GENEVA, N. Y., U. S. A.

NEW YORK: 44 Third Ave. at 10th St., Sutter Bros., Representatives
PHILADELPHIA: 116 Walnut St., Marine Equipment & Supply Co., Representatives
BOSTON: 84 Atlantic Ave., Gray-Aldrich Co., Representatives

Advertising Index will be found on page 138

Sterling
THE ENGINE of REFINEMENT
For the finest boats that float

Rainbow and Miss Sterling Win First and Second Place In Fisher-Allison Trophy Race

ESTABLISHING new records of 41.1 miles per hour for a two mile lap; 39.6 miles per hour for a fifty mile heat and 39 miles per hour for 150 miles, the RAINBOW again won the Fisher-Allison Trophy for displacement runabouts. MISS STERLING, with a duplicate of RAINBOW'S power plant, a single Model GRS Six Cylinder 275 H. P. Dual Valve STERLING, won second place.

After the races RAINBOW ran the mile trials at an average of 44.028 miles an hour and MISS STERLING, after the 150 mile Fisher-Allison Trophy Race, won the 50 mile free-for-all at 39 miles an hour.

Both boats are heavy family runabouts weighing over 6,000 pounds in racing trim.

The Fisher-Allison Trophy Races are to develop sturdy boats which can go and keep going indefinitely without adjustments. In three races, Detroit, Miami and Buffalo, all the STERLINGS participating have finished with perfect scores.

Such reliability is built also in the slower turning motors. The same crankshaft, camshafts, connecting rods, cylinders, gears and equipment which hold over 275 H. P. at over 1,950 R. P. M. in the six cylinder high speed model, are required to hold only 145 H. P. at 1,200 R. P. M. and 94 H. P. at 800 R. P. M. in the medium speed and heavy duty models.

May we tell you about STERLINGS?

Sterling Engine Company 1254 Niagara St., Buffalo, N.Y.

SPENDTHRIFT II
WINS BLOCK ISLAND RACE!

ONE hundred and fifteen miles through persistent fog to victory. "Spendthrift II" won the famous Block Island Race because of her ability to go and keep on going faster than her competitors, plus the able ability of her navigators to keep her on a true course, despite the heavy fog.

And Spendthrift II is Van Blerck Equipt

Which explains her wonderful dependability and good turn of speed. Again it is evident that a vast majority of the successful and satisfactory boats are equipt with Van Blerck Engines.

A four-cylinder Model MM-4 Van Blerck is installed in "Spendthrift II" and a cruising speed of 12 M.P.H. is obtained. A 45′ 6″ x 11′ x 2′ 9″ Cruiser, this able little ship was designed by C. D. Mower, built by the N. Y. Yacht, Launch & Engine Co. for W. R. Halsey, who thinks a whole lot of both his boat and his engine.

VAN BLERCK MOTOR COMPANY

Also Makers of High-Duty Commercial Motors

OFFICE AND WORKS AT MONROE, MICHIGAN

New York Sales and Service Branch—30 Church Street

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